

**DIFFERENTIAL EFFECTIVENESS
OF A BRIEF MOTIVATIONAL INTERVENTION
FOR CHILDREN AND ADOLESCENTS
FOLLOWING ACUTE ALCOHOL INTOXICATION
IN THE EMERGENCY DEPARTMENT**

Inaugural-Dissertation
zur Erlangung des Doktorgrades (Dr. phil.)
an der der Universität Hamburg,
Fakultät für Psychologie und Bewegungswissenschaft,
Institut für Psychologie

vorgelegt von
Silke Diestelkamp, Dipl. – Psych.
aus Kiel

Wissenschaftliche Betreuung
Prof. Dr. med. Dr. phil. Martin Härter
PD Dr. phil. Regine Klinger

Hamburg, 2017

**DIFFERENTIELLE WIRKSAMKEIT
EINER MOTIVIERENDEN KURZINTERVENTION
FÜR KINDER UND JUGENDLICHE
NACH AKUTER ALKOHOLINTOXIKATION
IM NOTFALLSETTING**

Datum der Disputation: 12. Juli 2017

Mitglieder des Promotionsprüfungsausschusses

Vorsitzender: Prof. Dr. Martin Spieß

Erstgutachter: Prof. Dr. Dr. Martin Härter

Zweitgutachterin: PD Dr. Regine Klinger

Erster Disputationsgutachter: Prof. Dr. Rainer Thomasius

Zweiter Disputationsgutachter: PD Dr. Timur Sevincer

TABLE OF CONTENTS

ABSTRACT		1
ZUSAMMENFASSUNG		2
LIST OF PUBLICATIONS		3
1 INTRODUCTION		5
1.1 Alcohol use in adolescence		5
1.2 Consequences of underage drinking		5
1.3 Theoretical models of adolescent alcohol use.....		6
1.4 Brief Motivational Alcohol Interventions.....		8
1.5 The concept of the teachable moment.....		10
1.6 Evidence for the effectiveness of brief alcohol interventions in the emergency department.....		10
1.7 Moderators of brief intervention effectiveness.....		12
1.7.1 Patient variables.....		12
1.7.2 Intervention variables.....		14
1.7.3 Counsellor variables.....		15
2 RESEARCH QUESTIONS		17
2.1 The framework research project <i>HaLT-Hamburg</i>		17
2.2 Research questions and related hypotheses.....		19
2.2.1 Research question 1		19
2.2.2 Research question 2		19
2.2.3 Research question 3		20
3 METHODS		23
3.1. Methodological background - Study protocol of the <i>HaLT-Hamburg</i> trial		23
3.2 Conceptual background - The <i>HaLT-Hamburg</i> intervention manual....		24
3.3 Empirical background - Systematic Review and Evidence Synthesis...		24
3.4 Effectiveness of the <i>HaLT-Hamburg</i> intervention		26
3.5 Latent class analysis of habitual drinking patterns		26
3.6 Analyses of moderators of intervention effectiveness.....		27
4 OVERVIEW OF PUBLICATIONS		29
4.1 Publication I - The <i>HaLT-Hamburg</i> study protocol (Methodological background).....		29
4.2 Publication II - The <i>HaLT-Hamburg</i> intervention manual		

(Conceptual background)	29
4.3 Publication III - Systematic literature review	
(Empirical background)	30
4.4 Publication IV - Effectiveness of the <i>HaLT-Hamburg</i> intervention	
(Research Question 1).....	31
4.5 Publication V - Habitual drinking patterns in adolescents with acute alcohol intoxication (Research question 2).....	32
4.6 Publication VI - Moderators of brief intervention effectiveness	
(Research question 3).....	33
5 DISCUSSION	36
5.1 Summary and discussion of overall results.....	36
5.2 Discussion of results regarding the effectiveness of the <i>HaLT-Hamburg</i> BMI	38
5.3 Limitations	41
5.4 Implications for future research	42
5.5 Practical implications	43
5.6 Conclusion	43
REFERENCES	45
APPENDIX I	61
Full-texts of publications for the dissertation	61
<i>Publication I.</i> Brief motivational intervention for adolescents treated for acute alcohol intoxication in the emergency department – a randomized controlled trial (Study protocol)	62
<i>Publication II.</i> Brief In Person Interventions for Adolescents and Young Adults following Alcohol-related Events in Emergency Care: A Systematic Review and European Evidence Synthesis	74
<i>Publication III.</i> Riskanter Alkoholkonsum bei Jugendlichen. Manual zur Durchführung einer motivierenden Kurzintervention	94
<i>Publication IV.</i> Short- to Midterm Effectiveness of a Brief Motivational Intervention to Reduce Alcohol Use and Related Problems for Alcohol Intoxicated Children and Adolescents in Pediatric Emergency Departments: A Randomized Controlled Trial	126
<i>Publication V.</i> Drinking patterns of alcohol intoxicated adolescents in the emergency department: a latent class analysis	142

<i>Publication VI. Einfluss von Berater/-innen- und Interventions-</i> <i>variablen auf die Veränderungsmotivation von Kindern und</i> <i>Jugendlichen nach einer motivierenden Kurzintervention zur</i> <i>Reduktion riskanten Alkoholkonsums</i>	152
APPENDIX II	169
Complete list of author's publications	169
APPENDIX III	175
Curriculum vitae	175

ABSTRACT

Background. Brief interventions (BI) in the emergency department (ED) provide an opportunity to motivate children and adolescents with risky alcohol use to reduce consumption. However, evidence of effectiveness of this approach is inconclusive. Against the theoretical background of motivational interviewing and the dual process framework of adolescent risk behaviour, this cumulative dissertation examined effectiveness and differential effectiveness of a brief motivational intervention (BMI) delivered in the presumed teachable moment potentially associated with medical treatment as a result of an acute alcohol intoxication (AAI).

Method. The methodological, conceptual, and empirical background for investigation of this research question were elaborated in a study protocol for a randomized controlled trial (RCT) testing the effectiveness of this approach, a systematic review on effectiveness of alcohol BIs for adolescent ED patients and an intervention manual for the delivery of a BMI for children and adolescents following an AAI. Characteristics of the target population with regard to habitual drinking and associated psychosocial problems were investigated using latent class analysis. Effectiveness of the BMI was tested in a RCT against treatment as usual (TAU), which comprised an information leaflet on alcohol-associated risks. Patient variables, counsellor variables and intervention content were examined as potential moderators of intervention effectiveness.

Results. N = 316 ED patients aged 12 to 17 years participated in the RCT. Latent class analysis of habitual drinking identified 5 distinct classes with 61.2% habitually consuming at low-risk. At-risk and high-risk drinking classes showed heterogeneous patterns of habitual drinking with high-risk drinking being most strongly associated with psychosocial problems. Mixed-effects analysis of covariance of data from the RCT revealed that participants who received the BMI did not reduce alcohol consumption and alcohol-related problems statistically significant stronger than participants who received TAU. Among the potential moderators analysed, multiple regression analyses revealed that perceived counsellors' positive affirmation was associated with greater readiness to change alcohol use after the BMI as was younger age of study participants and finishing the BMI with a goal setting agreement.

Conclusion. Superiority of the BMI over TAU in reducing alcohol consumption and related problems in adolescent AAI patients was not found in this study. However, analysis of habitual drinking and moderator analyses hold implications for further developments of the BMI in order to potentially enhance effectiveness of support for this target population.

ZUSAMMENFASSUNG

Hintergrund. Kurzinterventionen im Notfallsetting sind eine Möglichkeit, riskant Alkohol konsumierende Kinder und Jugendliche zu einer Reduktion des Konsums zu motivieren. Die Evidenz zur Wirksamkeit dieses Ansatzes ist jedoch uneinheitlich. Vor dem theoretischen Hintergrund der motivierenden Gesprächsführung und des dualen Prozessmodells jugendlichen Risikoverhaltens wurde in dieser kumulativen Dissertation die Wirksamkeit und differentielle Wirksamkeit einer motivierenden Kurzintervention untersucht, die in dem theoretisch angenommenen Moment erhöhter Lernbereitschaft durchgeführt wird, der mit einer Behandlung aufgrund einer akuten Alkoholintoxikation potentiell assoziiert ist.

Methode. Der methodische, konzeptuelle und empirische Hintergrund für die Untersuchung dieser Forschungsfrage wurde in dem Studienprotokoll einer randomisiert kontrollierten Studie zur Untersuchung der Wirksamkeit dieses Ansatzes ausgearbeitet, sowie anhand einer systematischen Literaturübersicht zur Wirksamkeit von Kurzinterventionen bei Jugendlichen, die aufgrund eines alkoholbedingten Vorfalls notfallmedizinisch behandelt werden und einem Interventionsmanual für die Durchführung einer motivierenden Kurzintervention mit Kindern und Jugendlichen nach einer Alkoholintoxikation. Charakteristika der Zielpopulation im Hinblick auf habituellen Alkoholkonsum und assoziierte psychosoziale Probleme wurden anhand einer latenten Klassenanalyse untersucht. Die Wirksamkeit einer motivierenden Kurzintervention wurde im Vergleich zur Standardbehandlung (Informationsbroschüre zu alkoholbezogene Risiken) in einer randomisiert kontrollierten Studie getestet. Patientenvariablen, Beratervariablen und Inhalt der Intervention wurden als potentielle Moderatoren der Wirksamkeit untersucht.

Ergebnisse. N = 316 Patienten im Alter von 12 bis 17 Jahren nahmen an der Studie teil. Die latente Klassenanalyse der habituellen Trinkmuster identifizierte 5 distinkte Klassen, worunter 61.2% habituell wenig riskant konsumierten. Die riskant und hoch-riskant konsumierenden Klassen zeigten heterogene Muster habituellen Alkoholkonsums, wobei hoch-riskantes Trinken am stärksten mit psychosozialen Problemen assoziiert war. Die Analyse der Daten der randomisiert kontrollierten Studie mittels gemischter Modelle zeigte, dass Studienteilnehmer, die die motivierende Kurzintervention erhalten hatten ihren Alkoholkonsum und alkoholbezogene Probleme nicht signifikant stärker reduzierten als Teilnehmer, die die Standardbehandlung erhalten hatten. Unter den untersuchten Moderatoren zeigte die multiple regressionsanalytische Auswertung, dass eine stärker wahrgenommene Wertschätzung durch den Berater mit einer größeren Bereitschaft zur Veränderung des Alkoholkonsums nach der Intervention einherging. Jüngerer Alter der Studienteilnehmer sowie das Beenden der Intervention mit einer Zielvereinbarung waren ausserdem mit einer höheren Veränderungsbereitschaft assoziiert.

Schlussfolgerung. Eine Überlegenheit der motivierenden Kurzintervention gegenüber der Standardbehandlung in Bezug auf eine Reduktion des Alkoholkonsums und alkoholbezogener Probleme wurde in dieser Studie nicht gefunden. Die Analyse der habituellen Trinkmuster und die Moderatorenanalyse liefern jedoch Ansatzpunkte für eine Weiterentwicklung der Intervention, um eine mögliche Verbesserung der Wirksamkeit eines Beratungsangebotes für diese Zielgruppe zu erreichen.

LIST OF PUBLICATIONS

The thesis is based on the following publications:

Publication I

Diestelkamp, S., Arnaud, N., Sack, P.-M., Wartberg, L., Daubmann, A., & Thomasius, R. (2014). Brief Motivational Intervention for Adolescents Treated for Acute Alcohol Intoxication in the Emergency Department – a Randomized-Controlled Trial. *BMC Emergency Medicine*, *14*:13.

Publication II

Diestelkamp, S., Drechsel, M., Arnaud, N., Baldus, C., & Thomasius, R. (2016). Brief in Person Interventions for Adolescents and Young Adults following Alcohol-related Events in Emergency Care: A Systematic Review and European Evidence Synthesis. *European Addiction Research*, *22*, 17-35.

Publication III

Diestelkamp, S., & Thomasius, R. (2017). *Riskanter Alkoholkonsum bei Jugendlichen. Manual zur Durchführung einer motivierenden Kurzintervention. [At-risk Alcohol Use in Adolescents. Manual for the Delivery of a Brief Motivational Intervention]*. Berlin, Heidelberg: Springer.

Publication IV

Arnaud, N., Diestelkamp, S., Wartberg, L., Sack, P.-M., Daubmann, A., & Thomasius, R. (2017). Short- to Midterm Effectiveness of a Brief Motivational Intervention to Reduce Alcohol Use and Related Problems for Alcohol Intoxicated Children and Adolescents in Pediatric Emergency Departments: A Randomized Controlled Trial. *Academic Emergency Medicine*, *24*, 186-200.

Publication V

Diestelkamp, S., Kriston, L., Arnaud, N., Wartberg, L., Sack, P.-M., Härter, M., & Thomasius, R. (2015). Drinking patterns of alcohol intoxicated adolescents in the emergency department: a latent class analysis. *Addictive Behaviors*, *50*, 51-59.

Publication VI

Diestelkamp, S., Wartberg, L., Arnaud, N., & Thomasius, R. (2016). Einfluss von Berater/-innen- und Interventionsvariablen auf die Veränderungsmotivation von Kindern und Jugendlichen nach einer motivierenden Kurzintervention zur Reduktion riskanten Alkoholkonsums. [Influence of counsellor- and intervention variables on motivation to change

in children and adolescents following a brief motivational intervention to reduce risky alcohol use]. *Praxis der Kinderpsychologie und Kinderpsychiatrie*, 65, 534-549.

Full texts of the publications are included in appendix I.

Note: Due to copyright issues publication no III is published in a shortened version (pages 1 – 20 only) in the published version of this dissertation.

1 INTRODUCTION

1.1 Alcohol use in adolescence

Alcohol use is one of the three leading risk factors contributing to the global burden of disease (Lim et al., 2012). Among children and adolescents, most alcohol-related harm is caused by episodic heavy drinking ("binge drinking") (Wechsler, Kuo, Lee, & Dowdall, 2000; Reboussin, Songa, Shrestha, Lohmana, & Wolfson, 2006; Deas, Riggs, Langenbucher, Goldman, & Brown, 2000; Müller et al., 2009). Binge drinking, i.e. consumption of 5 (4 for females) or more standard drinks on one occasion (Herring, Berridge, & Thom, 2008) in the past 30 days is reported by 39% of 15- to 16-year old European school children (Hibell et al., 2012). Whereas regular alcohol consumption among children and adolescents has been on the decline for the past 20 years (Orth & Töppich, 2015; Hibell et al., 2012), heavy episodic drinking has increased between 1995 and 2007 and remained stable on a high prevalence rate between 2007 and 2011 in many European countries (Hibell et al., 2012). This increase in heavy underage drinking is reflected by a sharp increase in numbers of children and adolescents in need of emergency medical treatment following acute alcohol intoxication (AAI) as recently observed in a number of European countries including Germany (Gesundheitsberichterstattung des Bundes, 2016), Great Britain (Healey, Rahmana, Faizal, & Kinderman, 2014), Austria (Fandler, Scheer, Rödl, & Müller, 2008), Switzerland (Caflisch & Uldry, 2013), the Netherlands (van Hoof, Van Der Lely, Pereira, & Van Dalen, 2010), Croatia (Bitunjac & Saraga, 2009), Bulgaria (Loukova, 2011) and the Slovak Republic (Kuzelova et al., 2009).

1.2 Consequences of underage drinking

Consequences of heavy underage drinking are manifold, with the acute consequences being most prevalent among children and adolescents (Fig. 1). Early onset of drinking and heavy drinking have been shown to be related to a number of risk behaviours such as drinking and driving, risky sexual behaviours, violence (as a victim or perpetrator) and behaviours resulting in serious injuries (Hingson, Heeren, & Winter, 2006; Hingson, Heeren, Zakocs, & Winter, 2002; Sindelar, Barnett, & Spirito, 2004). Somatic complications can arise from aspiration of vomit or from hypothermia caused by exposure to low temperatures after e.g. losing consciousness (Vonghia et al., 2008). The risk of committing suicidal actions is elevated for adolescents under the influence of alcohol (Windle, 2004). Apart from these short-term effects, social problems such as conflicts with parents, peers, teachers and police are common and may have a strong negative impact on adolescents' development and academic career (Miller, Naimi, Brewer, & Jones, 2007; Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994).

Furthermore, underage binge drinking has been shown to go along with an elevated risk for developing an alcohol dependence later in life (Viner & Taylor, 2007).

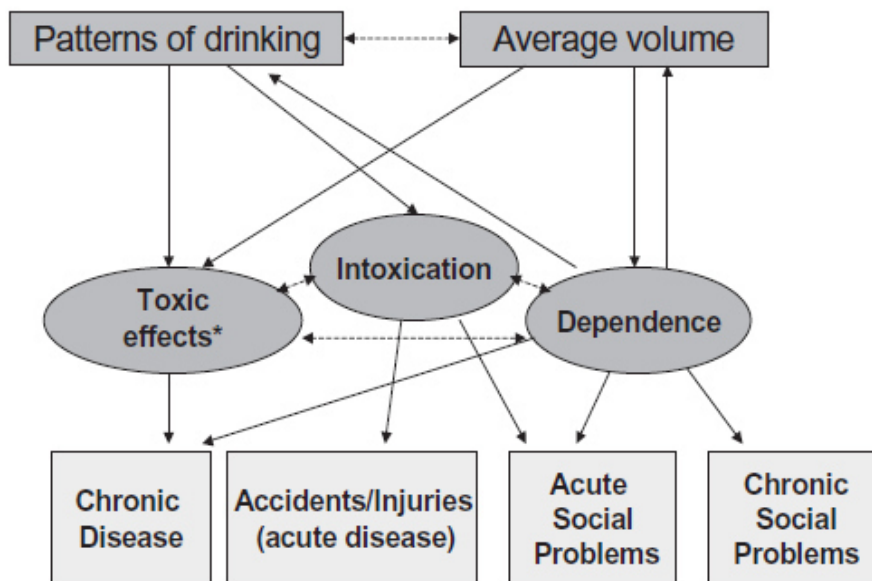


Figure 1. Alcohol consumption, effects of alcohol use and related consequences (Alcohol and Public Policy Group, 2010) (reprinted with permission)

1.3 Theoretical models of adolescent alcohol use

As opposed to problematic alcohol use in adults, with a wide variety of theoretically assumed underlying factors and developmental pathways (see West & Brown (2013) for an overview), alcohol use in adolescence is often conceptualised as “risk-taking behaviour” (Jessor & Jessor, 1977; Steinberg, 2010; Wiers, Ames, Hofmann, Krank, & Stacey, 2010; Wiers et al., 2007). This conceptualization is supported by a recent survey on drinking motives among 33.813 11- to 19 year-olds in 13 European countries, who consistently stated social and enhancement motives to be most influential on their alcohol use (Kuntsche et al., 2014). In particular, enhancement motives were most strongly related to frequency of drunkenness. Two theoretical models of alcohol use particularly useful for the prediction of heavy episodic drinking in adolescents will be outlined in the following section.

The framework for the prediction of risky behaviour in adolescents (Wiers et al., 2010) builds on psychological dual process models, which propose that behaviour is determined by controlled, reflective processes as well as by automatic, impulsive processes (Strack & Deutsch, 2004), a theoretical approach that has successfully been applied to the prediction of alcohol use and misuse in adolescents (Wiers et al., 2010; Wiers et al., 2007). Wiers et al. (2010) assume

that risky alcohol use is influenced by reflective control processes (e.g. self-control ability and motivation) and impulsive processes (e.g. automatic affective associations) (Fig. 2).

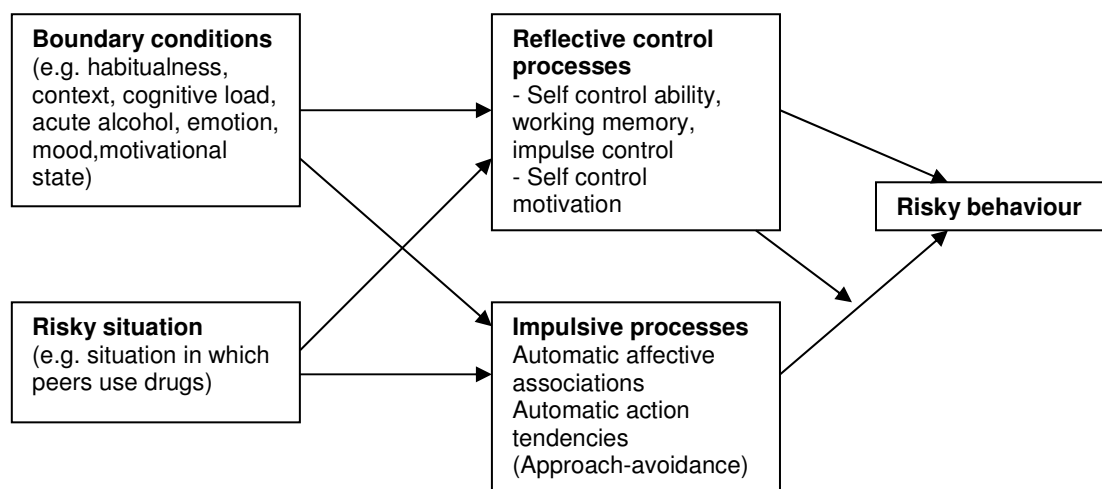


Figure 2. Framework for the prediction of risky behaviour in adolescents (Wiers et al., 2010; © 2010 Wiers, Ames, Hofmann, Krank and Stacey)

Additionally, Wiers and colleagues assume that a number of boundary conditions (e.g. motivational state) and characteristics of the situation influence both reflective and impulsive processes. For example, as proposed by limited resource models of cognitive capacity (Baumeister, Vohs, & Tice, 2007a; Steele & Josephs, 1990), acute alcohol use is assumed to reduce mental capacity for executing controlled cognitive processes (ego depletion) leading to an increased influence of impulsive processes (Baumeister & Vohs, 2007b, Wiers et al., 2007; Köpetz, Lejuez, Wiers, & Kruglanski, 2013). Chronic alcohol use, on the other hand, is presumed to increase the likelihood of future alcohol use, because habituation sensitizes appetitive motivation to consume and weakens controlled cognitive processes (Wiers et al., 2007).

The influence of reflective and impulsive processes on the decision to consume alcohol is also acknowledged in the motivation model of alcohol use by Cox and Klinger (2004). According to this affect regulation model, problematic drinking develops whenever drinking has a high incentive value for an individual in terms of reducing negative affect (drinking to cope) or increasing positive affect (drinking to enhance) (see also Cooper, Frone, Russell, & Mudar, 1995). A high incentive value of drinking strengthens positive affective associations with alcohol use and thereby strengthens the influence of impulsive processes. However, reflective processes such as the motivation for self-regulation mediate impulsive processes (Cox &

Klinger, 2004; Wiers et al., 2010; Baumeister & Vohs, 2007b) and are therefore often the focus of alcohol interventions such as brief motivational interventions (BMI) (Tanner-Smith & Lipsey, 2015).

1.4 Brief Motivational Alcohol Interventions

Brief interventions (BI) are commonly defined as a therapeutic or preventive intervention of short duration (Aalto et al., 2001) typically consisting of one to a maximum of four contacts (McQueen, Howe, Allan, Mains, & Hardy, 2011; Babor, 1994). Brief motivational interventions (BMI) are theoretically based on Motivational Interviewing (MI), a "client-centered, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence" (Miller & Rollnick, 2002¹, p. 25). They aim at enhancing motivation, defined as intensity (energy) and direction (approach or avoidance) (Oettingen & Gollwitzer, 2015), as a prerequisite for behaviour change (Prochaska, DiClemente, & Norcross, 1992).

Embedded in a respectful and empathic therapeutic attitude (MI spirit), the MI counsellor applies four principles (express empathy, develop discrepancy, roll with resistance, support self-efficacy) and seven groups of methods (affirmation, reflective listening, open questions, rolling with resistance, summarising, methods for eliciting change talk, methods for eliciting confidence talk) to elicit and strengthen motivation to change (phase 1) and to strengthen commitment to change (phase 2) (Miller & Rollnick, 2002), thereby strengthening desirability (incentive value) and feasibility (expectation) of behaviour change as the two determinants of motivation (Gollwitzer, 2012; Oettingen & Gollwitzer, 2015). From the perspective of the Transtheoretical Model of Behaviour Change (TTM) (Prochaska et al., 1992), MI aims at supporting clients to move through the stages of change (precontemplation, contemplation, preparation, action, maintenance) by applying specific counseling techniques appropriate to the client's current motivational state (Miller, 1999; Dimeff, Baer, Kivlahan, & Marlatt, 1999).

According to MI theory, exploration and resolution of ambivalence is the core mechanism through which motivation to change can be established (Miller & Rollnick, 2002; Feldstein Ewing, Apodaca, & Gaume, 2016). Ambivalence is expressed by clients' statements in favour of change (change talk) and in favour of the status quo (sustain talk). MI theory presumes a causal mediation chain with counsellors' behaviour influencing client change talk which, in turn, influences behaviour change (Moyers, Martin, Houck, Christopher, & Tonigan, 2009;

¹ A third edition was published in 2013 which includes an extensive make-over of the theoretical basis of MI. However, the 2nd edition (2002) is cited here, because the intervention tested in this dissertation was developed on the basis of the theoretical framework as put forward in the 2nd edition.

Magill et al., 2014). Three processes have been proposed to account for MI's effects on client change talk and thereby on client behaviour (Arkowitz, Miller, Westra, & Rollnick, 2008; Magill et al., 2014). First, MI spirit, such as the empathic therapeutic mindset, collaborative therapeutic alliance and respect for the client's autonomy (relational hypothesis). Second, counsellor's MI skills, such as open questions, simple and complex reflections, reframing and shifting focus as non-confrontational styles of dealing with resistance (technical hypothesis) and third, conflict resolution processes incorporating all processes directly addressing exploration and resolution of ambivalence, such as the use of the decisional balance exercise or contrasting of a desired future with reality (conflict resolution hypothesis).

Alcohol BMIs typically include elements like assessment, feedback, reflection on positive and negative consequences of alcohol use, imagining a future with changed and unchanged drinking behaviour, goal setting, change plan, and providing self-help materials (Spirito et al., 2004; Dimeff et al., 1999; Gaume, McCambridge, Bertholet, & Daeppen, 2014a). They typically reflect the two phases of MI (Miller & Rollnick, 2002)², starting off with eliciting and strengthening motivation to change and finishing with addressing the translation of motivation into behaviour, i.e. self-regulation (Oettingen & Gollwitzer, 2015). Self-regulation is primarily addressed by the BMI elements "goal setting" and "change plan", which includes identification of potential barriers for goal attainment and development of strategies to achieve goals (Köpetz, 2013).

BMIs can be delivered in a variety of settings ranging from general practitioners (GP) practices to community health centres, pharmacies or in-patient primary health care services (Kaner et al., 2007; Dhital, Norman, Whittlesea, & McCambridge, 2013). At-risk alcohol consuming children and adolescents are difficult to be identified and reached, since this target group does not regularly attend GPs or other community services (World Health Organization, 2015). However, the emergency department (ED) has been identified as one of the very few settings in which heavy drinking children and adolescents can successfully be identified and reached (Healey et al., 2014). In addition to being a setting granting access to adolescents irrespective of sociodemographic and -economic background, treatment in an ED is often presumed to be associated with a greater likelihood for subsequent health behaviour change, because it is assumed to provide a so called "teachable moment" (Lawson & Flocke, 2009).

² Miller & Rollnick (2013) replaced the 2-phases model (eliciting motivation and strengthening commitment) as proposed in Miller & Rollnick (2002) by a 4-process model (engaging, fokussing, evoking, planning), thereby refining the former phase 1 "eliciting motivation" into the 3 processes of "engaging, fokussing, evoking".

1.5 The concept of the teachable moment

Treatment in an ED is often referred to as providing a “teachable moment”, which is conceptualized as an “event or set of circumstances which leads individuals to alter their health behavior positively” (Lawson & Flocke, 2009, p. 25) and which is presumed to be associated with an increase in responsiveness to behaviour change counselling (Boudreaux, Bock, & O’Hea, 2012; Maio et al., 2000, Lawson & Flocke, 2009; Barnett et al., 2002). Furthermore, an ED visit caused by an alcohol-related event is assumed to be associated with an even greater effectiveness of alcohol BIs, an assumption which has received empirical support (Walton et al., 2008; Longabaugh et al., 1995). According to MI theory, the salient negative consequences of alcohol use in this situation facilitate exploration of ambivalence, especially in adolescent clients who often perceive little ambivalence towards their alcohol use (Wiers et al., 2007; Feldstein Ewing et al., 2016). Consequently, the ED visit following an AAI is presumed to represent a unique opportunity to reach at-risk alcohol consuming children and adolescents in a “window of opportunity” for delivering a brief alcohol intervention (Spirito et al., 2004).

1.6 Evidence for the effectiveness of brief alcohol interventions in the emergency department

A number of systematic reviews and meta-analyses found BIs to be effective in reducing alcohol consumption in adults (European Monitoring Centre for Drugs and Drug Addiction, 2016; O’Donnell et al., 2014; Wachtel & Staniford, 2010; Vasilaki, Hosier, & Cox, 2006; Nilsen et al., 2008; Tripodi, Bender, Litschge, & Vaughn, 2010; Kaner et al., 2007; McQueen et al., 2011; Burke, Arkowitz, & Menchola, 2003). A Cochrane review of 22 randomized controlled trials investigating effectiveness of BIs in general practice included more than 7500 adult participants and found significant reductions in alcohol use at 1 year and longer follow-ups in the intervention groups (Kaner et al., 2007). McQueen and colleagues (2011) prepared a systematic review on effectiveness of BIs delivered to heavy alcohol users in general hospital wards. They included 14 randomized controlled studies with participants of 16 years of age and older. Patients who had received a BI reported reduced alcohol consumption at 6 and 9 months follow-up when compared to control groups. Most BI research addressed primary health care settings and although inconsistent evidence for BI efficacy and effectiveness exists (Emmen, Schippers, Bleijenberg, & Wollersheim, 2004; Rhodes et al., 2015), the vast majority of cumulative evidence supports efficacy and effectiveness of alcohol BIs for adult populations in primary health care (Nilsen, 2010).

The few existing studies on alcohol BI efficacy and effectiveness for children and adolescents report heterogeneous results (Foxcroft, Coombes, Wood, Allen, & Almeida Santimano, 2014; Jensen et al., 2011; Kohler, & Hofmann, 2015). Different settings (e.g. college campuses, general practices, emergency departments) and heterogeneous interventions, outcome measures and study populations make it difficult to generalize findings (Wachtel, & Staniford, 2010). Whereas BIs for heavy drinking college students have been found to be effective in reducing alcohol consumption at least in the short term (6 months follow-up) and alcohol-related problems also over longer follow-up periods (Carey, Scott-Sheldon, Carey, & DeMartini, 2007a), evidence of BIs for adolescents in clinical settings is more inconclusive (Wachtel & Staniford, 2010). Yuma-Guerrero, Velasquez, Von Sternberg, Maxson, and Garcia (2012) conducted a systematic review on trials conducted in the US which included adolescents who screened positive for at-risk drinking in the ED. Although 4 of the 7 included studies in this review found a significant intervention effect on at least one outcome related to alcohol consumption or alcohol-related consequences, authors conclude that evidence is not clearly supporting effectiveness of screening, brief intervention and referral to treatment (SBIRT) for this target population. A systematic review by Newton et al. (2013) analysed trials evaluating “targeted” BIs (n = 4) (i. e. addressing adolescents whose ED visit was preceded by alcohol use) and “universal” BIs (n = 5) (i. e. addressing adolescents identified through screening). While most study participants in both control and intervention groups across the included studies reduced alcohol use and reductions were typically greater in the intervention groups, these differences were statistically non significant in the majority of studies. Significant intervention effects were found on selected outcomes only (quantity of alcohol use (Spirito et al., 2011) or alcohol-related consequences (Walton et al., 2010) and often varied across follow-up time points. Authors conclude that neither targeted nor universal BIs yielded clear benefits with regard to a reduction of alcohol use or alcohol-related problems.

In summary, findings do not provide a clear picture of evidence for BIs targeting alcohol-involved adolescents in the ED. Authors mainly attribute this inconsistency of findings to the small number of existing randomized controlled trials (n = 4; Newton et al., 2013) as well as the methodological heterogeneity of studies, such as varying patient inclusion criteria as well as intervention contents and BI delivery modes (Forsythe & Lee, 2012; Wilson, Heather, & Kaner, 2011; Yuma-Guerrero et al., 2012; Newton et al., 2013). In addition to generating a broader evidence base through the conduction of more and methodologically more comparable studies, another way to learn more about why some studies’ findings support effectiveness of

BIs for alcohol-involved adolescents in the ED and some do not is moderator analyses (Apodaca & Longabaugh, 2009; Field, Baird, Saitz, Caetano, & Monti, 2010; Daeppen, 2008).

1.7 Moderators of brief intervention effectiveness

As outlined above, the evidence base for effectiveness of BIs targeting alcohol-involved adolescents in the ED is inconclusive and to date it is not clear why some studies' findings support their effectiveness and some do not (Apodaca & Longabaugh, 2009; Field, Baird, Saitz, Caetano, & Monti, 2010; Daeppen, 2008). Consequently, moderator analyses are called for in order to shed light on variables influencing effectiveness (Daeppen, 2008; Kaner, 2010; Nilsen, 2010). The concept of a moderating variable has been defined as follows.

The effect of X on some variable Y is moderated by M if its size, sign, or strength depends on or can be predicted by M .

(Hayes, 2013, p. 208)

Moderator variable analysis provides answers to the question of who responds to an intervention under what circumstances (Kraemer, Kiernan, Essex, & Kupfer, 2008) (Fig. 3).

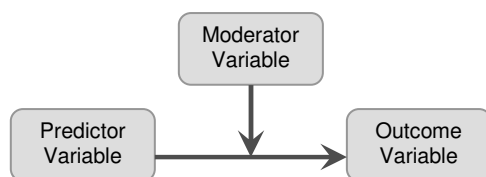


Figure 3

Moderator Model (adapted from Hayes, 2013)

Empirical findings on potential moderators of alcohol BI efficacy and effectiveness in various settings and for various target populations will be outlined in the following sections.

1.7.1 Patient variables

It has been suggested, that the target population addressed by a BI is an important aspect to consider when examining BI effectiveness (Wojnar, & Jakubczyk, 2014). Gender was examined as a potential moderator of alcohol BI effectiveness for adolescents in the ED by Monti et al. (1999) and Barnett et al. (2010). In both studies, no differential effects on males and females were found. A study comparing a face-to-face BI for children and adolescents in the ED with a face-to-face BI plus a computer-delivered exercise on drinking motives showed differential gender effects with females reducing their drinking significantly more when receiving the BI

plus computer-delivered exercises (Wurdak, Wolstein, & Kuntsche, 2016). However, another analysis of two BI studies on effectiveness of a BI in the ED for adolescents following an alcohol-related event found females to respond less to the intervention (Becker et al., 2012). Another study by Saitz and colleagues (2009) found non-alcohol-dependent women to reduce their drinking more than their male counterparts following a BI. The same study also examined age as a potential moderator of BI effectiveness and found younger adults to benefit more from a BI, as they showed greater reductions of alcohol consumption than older adults. Barnett et al. (2002) examined a sample of 13 – 19 year-old alcohol-positive ED patients and found younger age to be associated with a greater likelihood of being in the action stage for cessation of immoderate drinking at 3 months after receiving a BI.

Alcohol use severity at baseline has been studied more intensively as a moderator of BI effectiveness. Barnett et al. (2010) found BIs in the ED for 18 – 24 year-old young adults to be more effective for patients who screened positive in the Alcohol Use Disorder Test (AUDIT) at baseline. This finding is supported by another BI study of 13 – 17 year-old ED patients where the BI was more effective in reducing average number of drinking days per month and frequency of high-volume drinking for adolescents who screened positive for problematic alcohol use at baseline (Spirito et al., 2004), a finding that is supported by findings in adult ED patients (Blow et al., 2009). However, it has to be noted that BIs for alcohol dependent drinkers have been found to be less effective (Saitz et al., 2009). In a college student sample heavy alcohol users were also found to reduce their alcohol use less after a BI when compared to moderate users (Carey, Henson, Carey, & Maisto, 2007b). Moderator analyses of two RCTs examining BIs for 13 – 17 year-old and 13 – 18 year-old ED patients following an alcohol-related event found frequent high-volume drinking at baseline to be associated with worse response to the intervention (Becker et al., 2012). Barnett et al. (2002) also found lower alcohol use at baseline to be associated with greater likelihood of being in the action stage of change for cessation of immoderate drinking at 3 months follow up of a BI for alcohol-positive 13 – 19 year-old ED patients. In sum, despite some conflicting evidence, a number of findings support the hypothesis that BIs work best for individuals with moderate to risky drinking as opposed to low drinking and severe or dependent drinking (Barnett et al., 2010; Spirito et al., 2004; Blow et al., 2009; Saitz et al., 2009).

Some studies investigated whether the attribution of the ED visit as being caused by alcohol use moderated intervention effectiveness. Typically, alcohol BI studies in the ED include patients with a positive result in an alcohol screening test, regardless of whether alcohol use was involved in the event which lead to hospitalisation or not. Those studies which tested

whether attribution of the ED visit as being caused by alcohol use moderated intervention effects found that those patients who perceived alcohol to have contributed to their need for hospitalisation to reduce drinking more after a BI (Walton et al., 2008; Cochran, Field, & Caetano, 2014). Contrary to this finding, Barnett et al. (2010) found patients with lower attribution of alcohol in the event leading to hospitalization to be associated with lower alcohol use at 12 month follow-up of a BI.

Mental illness was examined as a potential moderator of BI effectiveness in a sample of adult ED patients. Six months follow-up data showed no differences in BI effectiveness for mentally ill and healthy control patients (Krupski et al., 2012). Barnett et al. (2002) found higher depression in adolescent ED patients treated for alcohol to be associated with greater readiness to change drinking behaviours. Furthermore, high levels of impulsivity often associated with externalizing behavioural problems have been found to go along with worse response to BIs in college-aged students (Feldstein Ewing, LaChance, Bryan, & Hutchison, 2009; MacKillop, & Kahler, 2009).

1.7.2 Intervention variables

The content of a brief intervention is an element often neglected in BI research (O'Donnell et al., 2014). In the more than 30-year history of BI research, content has changed substantially. Furthermore, the term BI is used for a variety of short interventions ranging from 5 minute brief advice to sophisticated 60 minute motivational interventions applying a broad range of methods, techniques and tools. It is therefore essential to take into account BI content as a factor influencing effectiveness (McCambridge, 2013).

BIs following the motivational interviewing technique may integrate different interactional tools, which have been studied with regards to their impact on BI effects. The decisional balance exercise, for example, is designed to support clients' perception of discrepancy between current behaviours and long- and mid-term goals in life, hereby eliciting and / or enhancing motivation to change harmful behaviours. According to MI theory and the conflict resolution hypothesis (Arkowitz et al., 2008; Miller & Rollnick, 2002), the central mechanism of change in MI is exploration and resolution of ambivalence. Hence, the application of MI tools such as the decisional balance exercise, which is presumed to help clients to explore benefits and costs of their current alcohol use, are assumed to facilitate raising awareness of ambivalence and thereby providing the first step on the way to resolution of ambivalence and establishment of a motivation to change. Whereas the conflict resolution hypothesis has generally received empirical support (McNally, Palfai, & Kahler, 2005), recent findings have

not supported the decisional balance exercise as an effective mechanism in BIs (Gaume et al., 2014a; Miller, & Rose, 2015).

Another MI tool is the readiness ruler, an instrument to assess readiness to change and to evoke client change talk by asking resource-oriented questions. According to the causal mediation chain of MI (Moyers et al., 2009; Magill et al., 2014) client change talk influences motivation to change. However, to the author's knowledge, no studies have investigated the effects of the use of the readiness ruler on intervention effectiveness to date.

According to MI theory (Miller & Rollnick, 2002), goal setting is an integral part of a MI intervention and is used in the second phase of MI to strengthen commitment to change. It is recommended to be applied with clients in the preparation stage of change according to the TTM (Prochaska et al., 1992; Miller, 1999) and is accompanied by the development of a change plan, an intervention component which aims at strengthening self-control ability as an important element of reflective control processes (Wiers et al., 2010). Lee et al. (2010) found alcohol BIs for hazardous drinkers in the ED to be associated with greater reductions in alcohol-related consequences when the intervention included a goal setting agreement and change plan of high quality.

1.7.3 Counsellor variables

Quality and quantity of counsellors' MI spirit and skills such as empathy, affirmation and supporting clients' autonomy are among the most important mechanisms of change according to MI theory (Miller & Rollnick, 2002). A recent study by Gaume et al. (2014b) found interventions by counsellors with more work experience, more favourable BMI attitudes and expectancies as well as higher MI skills to be associated with stronger reductions in alcohol use in a sample of 20 year-old male heavy drinkers. Another study conducted by the same research group (Daeppen et al., 2010) found superior counsellors' MI skills to be positively related to patients' utterances in favour of behaviour change (change talk) during the session, which in turn were associated with greater reductions in alcohol consumption at 12 month follow-up. Other studies also support the positive effect of counsellors' MI skills such as empathy, supporting clients' self-efficacy and highlighting clients' personal responsibility for change (Carey et al., 2007b; McNally et al., 2005; Gaume, Gmel, Faouzi, & Daeppen, 2009; Gaume, Gmel, & Daeppen, 2008). Furthermore, a literature review by Apodaca and Longabaugh (2009) found counsellors' behaviours inconsistent with MI theory to be associated with worse intervention outcomes. The impact of counsellors' empathy and therapeutic alliance on BI efficacy for heavy drinking college students was also investigated by Feldstein and Forcehimes

(2007). In this study, no influence of these counsellor variables on BI efficacy was found. Bertholet, Palfai, Gaume, Daeppen, and Saitz (2014) analysed three RCTs and found an effect contrary to MI theory, i.e. they found greater MI spirit to be associated with more drinking.

In sum, conditions influencing effectiveness of BIs are not well understood (Apodaca & Longabaugh, 2009; Daeppen, 2008; Gaume et al., 2014a) and there is a particular need for investigation of the differential effectiveness of alcohol BIs for children and adolescents in ED (Field et al., 2010), because only a small number of studies has been conducted in this setting with this target population. Knowledge on moderators of intervention effects is essential in order to tailor interventions to patients' needs, to develop appropriate interventions for nonresponders and to adapt interventions in order to make them more (cost-)effective (Kraemer et al., 2008).

2 RESEARCH QUESTIONS

The objective of this dissertation was to investigate the effectiveness of an alcohol BMI for children and adolescents delivered in a presumed teachable moment, i.e. following an acute alcohol intoxication and to examine conditions of effectiveness. Empirical data for answering this research question were drawn from the *HaLT-Hamburg* trial which will be described in the following section.

2.1 The framework research project *HaLT-Hamburg*

The empirical data analysed in this dissertation were collected in the research project *Health network 'alcohol abuse in adolescence': Improved access-to-care for children and adolescents with at-risk alcohol use ("HaLT-Hamburg")* which constituted a sub-project of *psychnet – the Hamburg Network for Mental Health* (Härter et al., 2012) funded by the German Federal Ministry of Education and Research [grant number 01KQ1002B]. The *HaLT-Hamburg* trial was conducted at the German Center for Addiction Research in Childhood and Adolescence (principal investigator: Rainer Thomasius; trial registration: Current Controlled Trials ISRCTN31234060).

The *HaLT-Hamburg* trial evaluated the effectiveness of a manualised BMI for children and adolescents following AAI in ED in reducing risky drinking (Sack, Diestelkamp, Küstner, & Thomasius, 2012). The *HaLT-Hamburg* BMI was based on the so called “bridging session” (*Brückengespräch*) of the German alcohol prevention programme *HaLT-Hart am Limit* (“Stop – close to the limit”) (Kuttler, 2006). This programme aims at reducing at-risk alcohol use in children and adolescents under 18 years through universal alcohol prevention activities (“*HaLT – proactive*”) and indicated prevention by offering children and adolescents who are treated in EDs following an AAI and their caregivers a so called “bridging session” (*Brückengespräch*) before they are released from hospital (“*HaLT – reactive*”). The programme *HaLT - Hart am Limit* is currently implemented at more than 150 locations across Germany (www.halt-projekt.de).

The *HaLT-Hamburg* trial evaluated the effectiveness of the approach of the “*reactive*” component (BI in the ED) of the *HaLT-Hart am Limit* programme. The trial was a two-arm cluster randomized controlled trial (RCT) with follow-up assessments at 3 and 6 months post intervention. Participants in the intervention group received standard medical care and a single session manualised alcohol BMI before discharge from hospital with one telephone booster session 6 weeks after the BMI. Caregivers of adolescents in the intervention group also received

a short manual-guided intervention. Participants in the control group received treatment as usual (TAU) only, which comprised standard medical care and written information on negative consequences of alcohol use in adolescence and information on a youth specific substance use counseling agency. Primary outcomes were reductions in numbers of binge drinking episodes in the past 30 days, quantity of alcohol use on a typical drinking day and alcohol-related problems in the past 3 months. Secondary outcome was further treatment seeking. Ethics approval was attained from the Chamber of Psychotherapists in Hamburg, Germany. Figure 4 displays the CONSORT flow diagram of the study design.

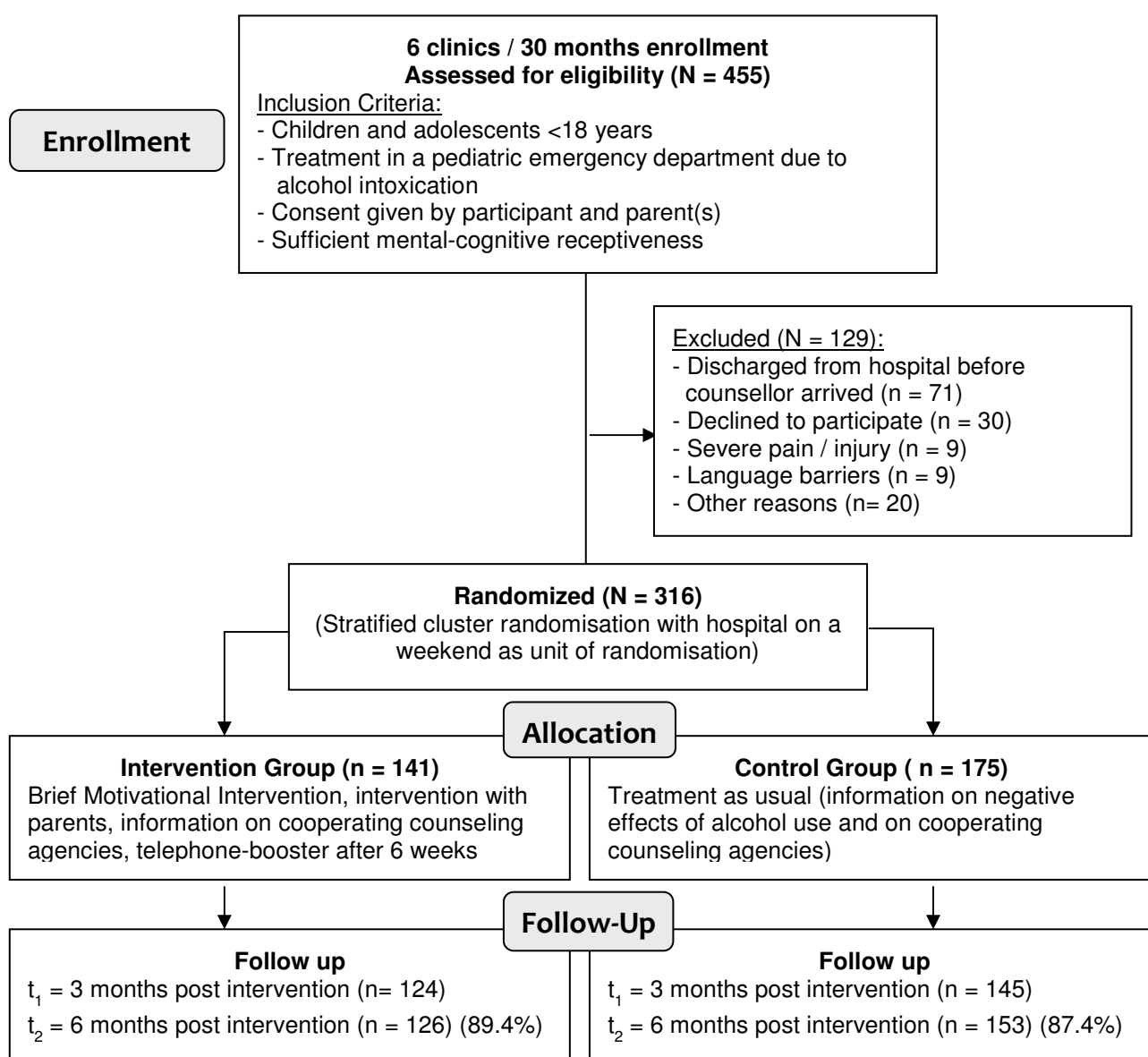


Figure 4. CONSORT flow diagram of the HaLT-Hamburg study design

2.2 Research questions and related hypotheses

In order to answer the overall research question on effectiveness and differential effectiveness of an alcohol BMI delivered to adolescent AAI patients in the ED, three research questions and related hypotheses were addressed in this dissertation and will be described in the following section.

2.2.1 Research question 1

As outlined in chapter 1.6 (*Evidence for the effectiveness of brief alcohol interventions in the emergency department*), evidence of the general approach of delivering alcohol BIs and BMIs to children and adolescents in the ED is currently scarce and existing evidence on their effectiveness is inconclusive. The *HaLT-Hamburg* trial was the first trial to evaluate effectiveness of this approach for adolescent AAI patients, no RCT has tested effectiveness of this approach in this specific target population before. Therefore, research question 1 reads as follows.

Research question 1: Are ED-based BMIs for children and adolescents treated for AAI more effective in reducing alcohol use and alcohol-related problems than treatment as usual?

According to the concept of the teachable moment (Lawson & Flocke, 2009) and MI theory (Miller & Rollnick, 2002), motivational interventions are presumed to be more effective when delivered under circumstances in which negative consequences of the respective behaviour are salient. These theoretical assumption is supported by empirical evidence (Barnett et al., 2002; Walton et al., 2008; Longabaugh et al., 1995). We therefore assume that, despite inconclusive evidence for the general approach of delivering alcohol BIs to adolescent ED patients, the *HaLT-Hamburg* BMI will be effective in reducing alcohol use and related harm, because it is delivered in the presumed teachable moment following an AAI. The related hypothesis 1 reads as follows.

Hypothesis 1. Study participants in the intervention group of the *HaLT-Hamburg* trial will reduce alcohol use and alcohol-related problems at 3 and 6 months follow-up statistically significant more than participants in the control group.

2.2.2 Research question 2

According to the dual process framework of risk behaviour in adolescence (Wiers et al., 2007; 2010), habitually frequent and heavy alcohol use strengthens impulsive processes involved in future alcohol through two pathways. First, habitual heavy alcohol use strengthens impulsive processes through sensitization, a process which strengthens the appraisal of alcohol as an

emotional stimulus, which in turn strengthens alcohol-associated automatic approach tendencies (Wiers, Van Woerden, Smulders, & De Jong, 2002). Second, frequent heavy alcohol use strengthens impulsive processes through the resulting accumulation of situations, in which the individual has to decide whether to engage in risky alcohol use or not while under the acute influence of alcohol (i.e. after consumption of the first glass). Acute alcohol use has been found to reduce cognitive processing capacity (ego depletion) which promotes the impact of impulsive processes on behaviour (Baumeister & Vohs, 2007b; Wiers et al., 2010). Because the MI approach primarily addresses reflective processes (i.e. motivation, self-regulation), it is assumed that habitual alcohol use moderates BMI effectiveness, a notion supported by empirical evidence (Barnett et al., 2010; Spirito et al., 2004; Blow et al., 2009; Saitz et al., 2009). As a first step preceding moderator analysis, the exploratory research question 2 will therefore examine habitual drinking patterns in the *HaLT-Hamburg* sample of adolescent AAI patients.

Research question 2: What kind of habitual drinking patterns can be identified in a sample of children and adolescents treated in an ED following AAI?

2.2.3 Research question 3

Research question 3 examines potential moderators of BMI effectiveness and hereby addresses client variables, counsellor variables, and intervention components.

Research question 3: Which variables moderate effectiveness of a BMI for children and adolescents treated in an ED following AAI?

Whereas MI theory emphasizes the role of counsellors' variables and intervention components as moderators of intervention effectiveness (Arkowitz et al., 2008; Miller & Rollnick, 2002), Wiers' and colleagues' framework of adolescent risk-behaviour (2010) and Cox' and Klingers motivational model of alcohol use (2004) provide the theoretical background for those hypotheses relating to patient characteristics as moderators of intervention effectiveness.

Habitual drinking patterns. As outlined above (*chapter 2.2.2*), habitual heavy alcohol use is assumed to strengthen the impact of impulsive processes on risky alcohol use (Wiers et al., 2007, 2010). Because BMIs primarily address reflective processes, it is assumed that a BMI for adolescents with habitual high-risk drinking is less effective than for risky drinkers. On the other hand, adolescents who habitually consume at low risk may experience little ambivalence about their drinking and, according to MI theory, may therefore be less likely to develop a motivation to change their alcohol use (Miller & Rollnick, 2002). A number of findings support the hypothesis that BMIs work best for individuals with moderate to risky drinking as opposed

to low drinking and severe or dependent drinking (Barnett et al., 2010; Spirito et al., 2004; Blow et al., 2009; Saitz et al., 2009). Consequently, hypothesis 2 of the dissertation reads as follows.

Hypothesis 2. Adolescents with risky habitual drinking at baseline reduce alcohol consumption more at 3 and 6 months following the *HaLT-Hamburg* BMI than adolescents with low-risk and high-risk habitual drinking.

Psychosocial problems. Psychosocial problems such as depression or externalizing behavioural problems may be associated with worse response to BIs in adolescents and young adults (Barnett et al., 2002; Feldstein Ewing et al., 2009; MacKillop & Kahler, 2009). According to affect regulation theories of alcohol use (Cooper et al., 1995; Cox & Klinger, 2004), a strong motive for alcohol use can be the reduction of negative affect (drinking to cope) or the increase in positive affect (drinking to enhance). Drinking to cope is presumed to be a symptom of inappropriate or missing alternative coping skills to avoid negative affect. Translated into the framework of adolescent risk-taking by Wiers et al. (2010), drinking to regulate affect would strengthen automatic affective associations with alcohol use and thereby strengthen impulsive processes involved in risky alcohol use. Additionally, according to Wiers et al. (2010), emotion and mood influence impulsive as well as reflective processes as boundary conditions. Impulse control, on the other hand, impacts reflective control processes directly. Hence, more severe psychosocial problems (e.g. depression/anxiety, self-esteem problems, anger-control problems, aggressive-dissocial behaviour) are assumed to strengthen the influence of impulsive processes and weaken the influence of reflective control processes and thereby reduce BMI effectiveness. Consequently, hypothesis 3 reads as follows.

Hypothesis 3. Adolescents with more severe psychosocial problems reduce alcohol consumption less at 3 and 6 months following a BMI in ED than adolescents with less severe psychosocial problems.

MI skills. In addition to patient variables, counsellor variables are assumed to moderate BMI effectiveness. MI skills such as counsellor's empathy and affirmation are among the most important mechanisms of change according to MI theory and specifically the relational hypothesis of MI (Arkowitz et al., 2008; Miller & Rollnick, 2002) (see chapter 1.4). Empirical findings mainly support this hypothesis (Carey et al., 2007b; McNally et al., 2005; Gaume et al., 2008; Gaume et al., 2009; Apodaca & Longabaugh, 2009; Feldstein & Forchimes, 2007; Bertholet et al., 2014). Consequently, hypothesis 4 reads as follows.

Hypothesis 4. Interventions lead by counsellors with perceived greater realization of MI skills are associated with greater reductions in alcohol consumption at 3 months following a BMI in ED.

Goal setting. According to MI theory (Miller & Rollnick, 2002), goal setting is an important element of an MI intervention and it is used to strengthen commitment to change once a motivation to change has been established. BMIs typically finish with a goal setting agreement accompanied by a change plan on how to achieve goals (Miller, 1999; Dimeff et al., 1999). Empirical support for goal setting as an active ingredient of BMIs was provided by Lee et al. (2010) (see chapter 1.4). Therefore, hypothesis 5 was formulated as follows.

Hypothesis 5. Interventions that finish with a written goal setting agreement are associated with greater reductions in alcohol consumption at 3 months following a BMI in ED.

Decisional balance. The decisional balance exercise is presumed to help clients to explore benefits and costs of their current health behaviour and to facilitate raising awareness of ambivalence as well as to resolve ambivalence (Miller & Rose, 2015). In the *HaLT-Hamburg* trial, use of the decisional balance exercise was optional to the counsellor. Evidence on the effects of applying the decisional balance exercise on BI effectiveness is inconclusive to date (McNally et al., 2005; Gaume et al., 2014a; Miller & Rose, 2015) (see chapter 1.4) so that the decisional balance exercise as a moderator of BI effectiveness was examined exploratory in this dissertation.

Exploratory analysis 1. Are interventions that include the use of the decisional balance exercise associated with greater reductions in alcohol consumption at 3 months following a BMI in ED?

Readiness and confidence ruler. The use of the readiness ruler as a tool to elicit and strengthen motivation to change and the confidence ruler as a tool to assess and strengthen confidence in behaviour change was also optional to the counsellors in the *HaLT-Hamburg* trial. Due to the lack of empirical evidence regarding the effects of the use of the readiness and confidence ruler on intervention effectiveness, this research question was examined exploratory.

Exploratory analysis 2. Are interventions that include the use of the readiness or confidence ruler associated with greater reductions in alcohol consumption at 3 months following a BMI in ED?

3 METHODS

This dissertation comprised six steps with six respective publications.

3.1. Methodological background - Study protocol of the *HaLT-Hamburg* trial

In a first step, the study design for the randomized controlled *HaLT-Hamburg* trial was developed and the background, rationale, hypotheses and methodology of the trial, which provided the empirical data for this dissertation, were outlined in the study protocol. The trial was conceptualized as a two-arm cluster-randomized trial with hospital at a weekend as unit of randomization. Eligible for study participation were children and adolescents admitted for AAI (diagnosis F10.0; ICD 10; World Health Organization, 2011) and their caregivers if they fulfilled the following inclusion criteria: 1. at hospitalization they were under the age of 18 years, 2. at time of intervention delivery they had sufficiently recovered from AAI and showed sufficient mental-cognitive receptiveness, 3. they were fluent in German, 4. informed consent was given by participant and parent(s)/caregiver(s), 5. absence of severe injuries. Baseline data were collected in hospital by research assistants. Follow-up assessments were conducted via telephone 3- and 6-months after hospitalization. Primary hypothesis were defined as the expectation that study participants in the intervention group would reduce alcohol use (past 30 day binge-drinking frequency and number of standard drinks consumed on a typical drinking occasion) and alcohol-related problems at 3 and 6 month follow-up stronger than participants in the control group in a statistically significant way. Binge drinking was defined as consumption of 5 (4 for girls) or more alcoholic drinks at one occasion (Herring et al., 2008) and was assessed using a single question adapted from the Alcohol Use Disorder Identification Test Consumption subscale (AUDIT-C) (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993). A standard drink was defined to include 10 g ethanol. Alcohol-related problems were assessed by a brief version of the Rutgers Alcohol Problem Index (RAPI) (Earleywine, LaBrie, & Pedersen, 2008). Participants were asked 16 questions about the frequency of experiencing different problems in the past 3 months while they were drinking alcohol or as a result of their alcohol use (“Not able to do your homework or study for a test”; “Got into fights with other people (friends, relatives, strangers)”; “Wanted to stop drinking but you couldn't”). Response options ranged from “never” to “more than 10 times”. Sample size calculation revealed a required total sample size of $N = 312$ for the detection of a medium effect (0.26) with 80% power, a type I error set at 5%, and an assumed intra-cluster correlation of 0.05. Statistical analyses were planned to be conducted using mixed-effects analysis of covariance (ANCOVA) models

adjusted for baseline differences to examine differences between intervention and control group with intervention condition as fixed effect and clusters (hospital on a weekend) as random effect on an intention-to-treat (ITT) basis.

3.2 Conceptual background - The *HaLT-Hamburg* intervention manual

In a second step, the concept of the BMI was developed and outlined in a counselling manual. The 45-minute brief intervention is based on MI (Miller & Rollnick, 2002³) and components reflected BMI elements as put forward by Spirito et al. (2004). Its 5 components are: 1. Introduction to the session with positive feedback on patient's willingness to engage in the intervention, expression of interest and concern transporting a positive and empathic therapeutic mindset and explanation of the intervention's aim and content. 2. A semi-structured interview assessing circumstances of the intoxication and alcohol-related risk behaviors. 3. Exploration phase incorporating discussion of motivation to drink, normative feedback, exploring pros and cons of current alcohol use, optional use of MI tools (i.e., importance and confidence ruler, decisional balance exercise) and establishment of future scenarios with changed and unchanged alcohol use. 4. Summary in which the counsellor structures and sums up what has been discussed, highlights personal responsibility for change and asks the patient for his/her conclusion from what has been discussed so far. 5. Closure of the session beginning with identification of drinking goals and potential barriers and development of strategies for goal attainment. The BMI session is finished with a written agreement on drinking goals, the introduction of a cooperating youth-specific counseling agency and affirmation of patient's self-efficacy. Additionally, the manual provides detailed information on realisation of the parent intervention and telephone-booster session. The manual comprises theoretical background and practical guidance for all elements of the intervention.

3.3 Empirical background - Systematic Review and Evidence Synthesis

In a third step of the dissertation, the empirical background regarding effectiveness and feasibility of the approach of delivering BIs in the ED to adolescents in the presumed teachable moment following an alcohol-related event was examined by conducting a systematic literature review and grey literature search. The systematic literature review aimed at providing an overview over current findings on the effectiveness of BIs for this target group. A search for controlled trials evaluating BIs for participants aged 12–25 years treated in an ED following an

³ Aspects of the updated theoretical MI conceptualization as put forward in the 3rd edition (Miller & Rollnick, 2013) were referred to in the final version of the manual.

alcohol-related event was conducted. Additionally, a grey literature search was conducted to support findings from the systematic review with evidence from practice projects and uncontrolled trials. Following the RE-AIM framework for programme evaluation (Glasgow, Vogt, & Boles, 1999), data on effectiveness, acceptance, implementation and reach were extracted from all relevant records.

For the systematic review, the databases Medline, EMBASE, PubMed, Science Citation Index Expanded & Social Sciences Citation Index (Web of Science), PsycInfo, Database of Abstracts of Reviews and Effects (DARE), CINAHL, Cochrane Clinical Trials & Cochrane Database of Systematic Reviews, Psyn dex and Current Controlled Trials were searched. Search terms for the study population were ‘adolescen *’, ‘child *’, ‘youth’ and ‘young’ each combined by the Boolean operator ‘OR’. Search terms for the intervention were ‘intervention’, ‘brief intervention’, ‘early intervention’, ‘psychotherapy, brief’ each combined by ‘OR’. The study outcomes were addressed by the search terms ‘alcohol *’, ‘substance’, ‘ethanol’, ‘binge drinking’, ‘atrisk drinking’, ‘problem drinking’, ‘high-risk drinking’, ‘risky drinking’, ‘alcohol drinking’, ‘alcohol-related disorders’ and ‘alcoholic intoxication’, again combined by ‘OR’. The setting was addressed by the search terms ‘hospital *’, ‘emergency department’, ‘emergency care’, ‘emergency service’, ‘hospital’, ‘emergency medical services’, ‘emergency medicine’, ‘emergency treatment’, ‘hospital department’ and ‘emergency services, psychiatric’ combined by ‘OR’. In a final step, all search results for the searches ‘population’, ‘intervention’, ‘outcome’ and ‘setting’ were combined by ‘AND’ to retrieve the relevant list of records.

In order to collect additional evidence for effectiveness and feasibility of BIs in this context stemming from uncontrolled trials, best practice reports, government documents or press releases, web-based searches with the search engine ‘google’ were conducted using the keywords ‘alcohol’, ‘alcohol intoxication’, ‘adolescents’, ‘underage’, ‘minor’, ‘emergency department’, ‘brief intervention’ in combination with names of European countries.

Records were included in the systematic review if (1) study participants were aged between 12-25 years and (2) were treated in an emergency care setting (inpatient or outpatient) following an alcohol-related event, (3) the intervention was brief (max. 60 mins) consisting of a maximum of 3 sessions with a minimum of one session delivered in the ED, (4) outcome measures addressed alcohol consumption, alcohol-related risk behaviours, alcohol-related negative consequences and / or seeking of further alcohol treatment or counselling, (5) control condition(s) consisted either of no treatment, standard care, an intervention other than a BI or a BI of different intensity, and (6) the study design was a controlled trial with one or more follow-

up assessments. Records were included in the analysis of the grey literature search if inclusion criteria (1) – (4) were met, respectively.

The systematic review was conducted according to the standards defined in the PRISMA statement (Moher, Liberati, Tetzlaff, & Altman, 2009). Data were extracted using a checklist that was developed on the basis of the Cochrane Effective Practice and Organisation of Care Group (EPOC) Data Collection Checklist (Cochrane Effective Practice and Organisation of Care Group, 2002) and methodological quality of the selected studies was assessed using the Cochrane Collaboration's tool for assessing risk of bias (Higgins & Green, 2011).

3.4 Effectiveness of the *HaLT-Hamburg* intervention

In the fourth step of the dissertation, research question 1 was addressed by testing the effectiveness of the *HaLT-Hamburg* BMI in reducing binge-drinking frequency, number of alcoholic drinks on a typical drinking occasion and alcohol-related problems as assessed by the RAPI (Earleywine et al., 2008) in comparison to the control condition (TAU). Analyses were based on intent-to-treat and multiple imputation was used to account for missing follow-up outcome data and single missing values. Statistical analyses were conducted as outlined in the description of the study protocol (chapter 3.1). Analyses were performed using SPSS statistical software package (version 22) (IBM, 2012).

3.5 Latent class analysis of habitual risky drinking patterns

As a fifth step of the dissertation and as a prerequisite for moderation analyses regarding habitual drinking, a latent class analysis (McCutcheon, 1987) examined habitual risky drinking patterns in the *HaLT-Hamburg* sample. Research question 2 was addressed in this step of the dissertation. According to prior research (Barnett et al., 2010; Spirito et al., 2004; Becker et al., 2012; Barnett et al., 2002), severity of baseline drinking is one of the moderators of BI effectiveness for adolescents most supported by empirical evidence. However, descriptive information on alcohol use in samples of adolescent AAI patients provide little information on subgroups of risky drinkers, since they traditionally report means of one-dimensional measures for the entire sample and hereby obscure patterns of variable endorsement relevant for identifying high-risk subgroups.

Therefore, the author examined patterns of drinking defined by a combination of variables representing different aspects of risky drinking in adolescence, an approach recently used in a number of studies examining adolescent drinking (Chiauzzi, DasMahapatra, & Black, 2013; Ray, Stapleton, Turrisi, & Phillion, 2012; Reboussin et al., 2006; Bohnert et al., 2014).

Latent class analysis (LCA) was used to identify subgroups of adolescents with distinct patterns of habitual risky drinking as defined by quantity of consumed alcohol on a typical drinking occasion, frequency of binge drinking and drunkenness, alcohol-related problems, prior alcohol-related hospitalizations and alcohol-related risk behaviors. Characteristics of the identified latent classes were examined with regard to sociodemographics, concurrent substance use and psychosocial problems applying analysis of variance (ANOVA) and chi-square tests using SPSS statistical software package (version 22) (IBM, 2012). Latent class analysis was performed using MPlus Version 5 (Muthén & Muthén, 2011).

3.6 Analyses of moderators of intervention effectiveness

In the last step of the dissertation, potential moderators of BI effectiveness were examined (research question 3). Sociodemographics (age, gender, school status), habitual risky drinking and psychosocial problems were tested as patient variables potentially moderating intervention effectiveness. Habitual risky drinking was operationalized as membership in one of the latent classes of habitual risky drinking identified in the LCA described in the previous paragraph (*chapter 3.5*). Psychosocial problems were assessed using the Screening for Mental Disorders in Adolescence (SPS-J) (Hampel & Petermann, 2005) with its subscales for internalizing (anxiety/depression, Cronbach's $\alpha=.89$, and self-esteem, Cronbach's $\alpha=.71$) and externalizing (aggressive-dissocial behavior, Cronbach's $\alpha=.78$, and anger-control problems, Cronbach's $\alpha=.75$) problems. Analyses of moderating effects of patient variables were conducted by including the respective variables as covariates in the analyses of intervention main effects applying mixed-effects analysis of covariance (ANCOVA) models in SPSS (IBM, 2012).

The influence of counsellor variables (perceived empathy, positive affirmation, competence, congruence) and components of the intervention (use of the readiness and confidence ruler, decisional balance exercise, written goal agreement) on intervention effectiveness was examined using multiple regression analysis with counsellors' and intervention variables as predictors and alcohol consumption at 3 month follow-up as dependent variable. To examine counsellors' MI skills, patients in the BMI group rated counsellors' empathy, affirmation, competence, and congruency using the short version of the Index of Basic Therapeutic Skills (BIS) (Stucki, 2004) on a 4-point Likert scale (e.g., "counsellor respects me and cares for me"; 0="totally disagree"; 3="totally agree", Cronbach's $\alpha=.91$). Counsellors documented the use of the readiness and confidence ruler, the decisional balance exercise and the preparation of a written goal setting agreement on a documentation sheet using a binary yes / no answering format. Readiness to change was assessed using an algorithm (Heidenreich &

Hoyer, 2001) allowing allocation of individuals to the different stages of change as proposed by Prochaska and DiClemente (1983). Adolescents' and counsellors' age and gender were included as covariates in the regression analysis.

4 OVERVIEW OF PUBLICATIONS

The dissertation comprises six publications reflecting the six steps of the dissertation as outlined in the methods section. While the background and methods applied for the six steps have been described in the previous chapters, this section focusses on providing an overview over the results of the six respective publications. Full texts of the publications are included in appendix I.

4.1 Publication I – The *HaLT-Hamburg* study protocol (Methodological background)

The background, rationale, hypotheses and methodology of the *HaLT-Hamburg* trial, which provided the empirical data analyzed in this dissertation, were outlined in a study protocol.

Reference. Diestelkamp, S., Arnaud, N., Sack, P.-M., Wartberg, L., Daubmann, A., & Thomasius, R. (2014). Brief Motivational Intervention for Adolescents Treated for Acute Alcohol Intoxication in the Emergency Department – a Randomized-Controlled Trial. *BMC Emergency Medicine*, 14:13.

4.2 Publication II – The *HaLT-Hamburg* intervention manual (Conceptual background)

The theoretical background and practical guide for the *HaLT-Hamburg* BMI and parent intervention was outlined in the respective intervention manual for counsellors. The manual provides information on prevalences, consequences and motives for risky alcohol use in adolescence. Additionally, three theoretical models of adolescent alcohol use are introduced, risk and protective factors are described and criteria for detection of risky alcohol use in children and adolescents are presented. The introduction section finishes with an overview over the current state of research on effectiveness of alcohol BIs followed by a comprehensive outline of the theoretical background of MI according to Miller & Rollnick (2002; 2013) and the transtheoretical model of behaviour change (Prochaska & DiClemente, 1983; Prochaska et al., 1992). Evaluation results of the *HaLT-Hamburg* trial are outlined and discussed in the following chapter. The final chapter of the manual comprises a detailed description and guide to the delivery of the *HaLT-Hamburg* BMI for adolescent AAI patients, the parent intervention and the telephone booster.

Reference. Diestelkamp, S. & Thomasius, R. (2017). Riskanter Alkoholkonsum bei Jugendlichen. Manual zur Durchführung einer motivierenden Kurzintervention. Berlin, Heidelberg: Springer.

4.3 Publication III – Systematic literature review (Empirical background)

The empirical background regarding effectiveness, feasibility and current status of implementation of the approach of delivering BIs in the ED to adolescents in the presumed teachable moment following an alcohol-related event was examined by conducting a systematic literature review supported by a grey literature search.

Reference. Diestelkamp S, Drechsel M, Arnaud N, Baldus C, Thomasius R (2016). Brief in Person Interventions for Adolescents and Young Adults following Alcohol-related Events in Emergency Care: A Systematic Review and European Evidence Synthesis. *European Addiction Research*, 22, 17-35.

Results. Seven randomised controlled trials (RCT), 6 practice projects, 1 non-randomised pilot study and 1 observational study were identified. Six of the seven RCTs observed reductions of alcohol consumption following the ED visit regardless of the form of care. Two RCTs found statistically significant differences between conditions for alcohol consumption outcomes (Monti et al., 2007; Spirito et al., 2011) and two studies found such differences for subgroups based on gender (Wurdak & Wolstein, 2012) or baseline alcohol use (Spirito et al., 2004). Combined effects for the 3 alcohol consumption outcomes (drinking quantity, drinking frequency and frequency of high-volume drinking) were calculated for 4 RCTs which reported relevant data and ranged from $d = 0.19$ (Spirito et al., 2004; Spirito et al., 2011) to $d = 0.20$ (Segatto, Andreoni, de Souza, Diehl, & Pinsky, 2011) and $d = 0.25$ (Monti et al., 2007). Of the 4 RCTs that examined effects on alcohol-related problems (Spirito et al., 2004; Monti et al., 1999; Segatto et al., 2011; Monti et al., 2007), one (Monti et al., 1999) reported statistically significant stronger reductions in the BI group at 6 month follow-up compared to the standard care group. Seven of the 15 publications identified in the searches assessed whether study participants accessed alcohol treatment or counselling following the BI (Caflisch & Uldry, 2013; Monti et al., 1999; Newton et al., 2013; Monti et al., 2007; Delphi, 2010; Fenzl, Mayring, Drobesh-Binter, Moshitz, & Gschwendner, n.d.; Stolle, Sack, Broening, Baldus, & Thomasius, 2013). Referral rates in BI groups ranged from 17% (Fenzl et al., n.d.) to 88% (Caflisch & Uldry, 2013) with a mean referral rate of 35.4%. On average, 68.8% of eligible youth agreed to take part in the BI. Participation rates ranged from 21.7% (Fenzl et al., n.d.) to 97.8% (Segatto et al., 2011). Acceptance of the BI by patients and / or clinic staff was systematically assessed in 3

studies (Spirito et al., 2004; Wurdak & Wolstein, 2012; Delphi, 2010) with ratings varying between “good” and “very good”. Data on implementation were reported in 3 of the 15 publications (Wurdak & Wolstein, 2012; Spirito et al., 2011; Prognos, 2008) with ‘good’ to ‘satisfactory’ ratings of feasibility of BI delivery in the hospital setting.

In sum, findings indicate growing research efforts into this approach and the number of identified practice projects reflects a need perceived by practitioners to address this target population with appropriate support. However, evidence of effectiveness of this approach in reducing consumption and related harm remains weak. Data on acceptance, implementation and reach indicated feasibility of integrating alcohol BIs in the clinical setting, although data on these measures were infrequently collected.

4.4 Publication IV - Effectiveness of the *HaLT-Hamburg* intervention (Research Question 1)

This step of the dissertation tested the hypothesis that the *HaLT-Hamburg* BMI is more effective in reducing risky drinking than TAU by analysing 3 and 6 months follow-up data of the *HaLT-Hamburg* trial. Additionally, moderator analyses of patients’ sociodemographic variables (age, gender, school status), and psychosocial problems (SPS-J, Hampel & Petermann, 2005) were reported in this publication.

Reference. Arnaud, N., Diestelkamp, S., Wartberg, L., Sack, P.-M., Daubmann, A., Thomasius, R. (2017). Short- to Midterm Effectiveness of a Brief Motivational Intervention to Reduce Alcohol Use and Related Problems for Alcohol Intoxicated Children and Adolescents in Pediatric Emergency Departments: A Randomized Controlled Trial. *Academic Emergency Medicine*, 24, 186-200.

Results. Study participants in both the intervention and the control group reduced alcohol consumption and alcohol-related problems significantly after hospitalisation. However, the differences between groups were statistically non-significant at both follow-ups. At 3 months follow-up, the mean change in binge drinking frequency was -1.36 (95% confidence interval [CI], -1.81 to -0.91), a reduction of 62.1% in the BMI group and -1.29 (95% CI, -1.77 to -0.95), a reduction of 49.0% in the control group. The mean change in number of alcoholic drinks consumed on a typical drinking occasion was -2.24 (95% CI, -3.18 to -1.29), a reduction of 37.5% in the BMI group and -1.34 (95% CI, -2.54 to -0.14), a reduction of 26.4% in the control group. The mean change of alcohol-related problems was -6.72 (95% CI, -7.68 to -5.76), a reduction of 60.5% in the BMI group and -6.43 (95% CI, -7.37 to -5.49), a reduction of 58.3% in the control group. The difference in mean changes between groups were similar at 6 months

follow-up for all outcomes. Moderation analyses including gender, age, school status and psychosocial problems (SPS-J, Hampel & Petermann, 2005) were also non-significant.

4.5 Publication V - Habitual drinking patterns in adolescents with acute alcohol intoxication (Research question 2)

As a prerequisite for moderator analyses of habitual risky drinking, latent classes of habitual drinking were examined in the *HaLT-Hamburg* sample. Latent habitual drinking classes were compared with regard to patients' age, gender, concurrent substance use and psychosocial problems.

Reference. Diestelkamp, S., Kriston, L., Arnaud, N., Wartberg, L., Sack, P.-M., Härter, M., & Thomasius, R. (2015). Drinking patterns of alcohol intoxicated adolescents in the emergency department: a latent class analysis. *Addictive Behaviors*, 50, 51-59.

Results. Five sufficiently large classes of adolescents with meaningfully distinct habitual drinking patterns were identified. 61.2% of the sample reported low-risk habitual drinking (class 1, "low-risk") as characterized by below sample average alcohol consumption, alcohol-related problems, and alcohol-related risk behaviors. Membership in this class was associated with negative screening results for problematic use of other substances and psychosocial problems.

Class 2 "moderate risk" (5.7%) was characterized by a relatively high proportion of adolescents reporting at least one occasion of drunkenness (66.7%) and binge drinking (58.8%) in addition to the index episode accompanied by a positive CRAFFT-d screening (Tossmann, Kasten, Lang, & Strüber, 2009). While adolescents in this class exhibited risky alcohol use and experienced some alcohol-related problems, this class did not show high scores on other risk factors associated with the development of alcohol-related disorders such as other substance use or psychosocial problems. Class 3 "frequent drunk" (15.8%) was most prominently characterized by a very high prevalence of drunkenness (100% at least once in the past 30 days) and frequency of drunkenness (median of 4 occasions in the past 3 months). Similar to class 2, adolescents in this class screened positive for alcohol-related risk behaviors while not exhibiting frequent other substance use or psychosocial problems. Members of classes 2 and 3 (16.5% of the total sample) were classified as habitual risky drinkers.

Classes 4 and 5 (16.5% of the sample) were classified as high-risk drinkers. Class 4 "alcohol-related problems" (11.4%) comprised adolescents reporting severe alcohol-related problems as indicated by a mean brief RAPI-score 4 times above that of class 1 and by the highest proportion of adolescents with previous alcohol-related hospitalizations (32.5%). Membership in this class was associated with most severe psychosocial problems, in particular

with a positive screening result for aggressive-dissocial behavior and anxiety/depression. Furthermore, members of this class reported most days of nicotine use and scored high on drug-related risk behaviors. Class 5 "excessive drinking" (5.1%) was most strongly characterized by excessive drinking with a mean consumption of 18.46 standard drinks on a typical drinking occasion. This group also showed high prevalences and frequencies of binge drinking and drunkenness, screened positive for alcohol-related risk behaviors (CRAFFT-d), and exhibited a very high average brief RAPI score indicating severe alcohol-related problems. This group also screened positive for psychosocial problems, in particular aggressive-dissocial behavioral problems.

Drinking classes did not differ with regard to sociodemographic variables. Two additional classes were identified in the LCA. However, these classes were underrepresented (3.8% of the total sample; $n = 6$ each) and could therefore not be included in further analyses. Preliminary descriptive analyses indicated that these classes may represent further subgroups of high-risk drinking with a mean of 22.2 standard drinks consumed on a typical drinking day (SD 2.98) in class 6 and a median 3-month frequency of drunkenness of 19 occasions (IQR 13) in class 7.

In sum, findings revealed that in the *HaLT-Hamburg* sample of 12 to 17 year-old AAI patients, habitual drinking patterns were very heterogeneous with 61.2% reporting habitual low-risk drinking. Additionally, findings revealed a class of adolescents who are frequently drunk without experiencing major negative alcohol-related consequences and another class comprising adolescents experiencing severe alcohol-related problems while consumption is moderate. High-risk habitual drinking was associated with an elevated risk for aggressive-dissocial behavioral problems. Findings may be used for tailoring BMIs.

4.6 Publication VI - Moderators of brief intervention effectiveness (Research question 3)

In the last step of the dissertation, moderating effects of patient variables, counsellor variables and intervention components were examined. Moderating effects of patient variables, i.e. sociodemographic variables and psychosocial problems were examined and reported in publication IV (chapter 4.4). No moderating effects of the examined patient variables were found. Null findings for the moderating effect of habitual drinking operationalized as membership in the latent classes of habitual risky drinking (publication V, chapter 4.5) were not published.

Moderating effects of counsellor variables and intervention components were analysed in publication VI, the results of which are described in the following section. As outlined in hypotheses 3-5 and exploratory analyses 1 and 2 (see chapter 2.2.3), examination of moderating effects was planned to be conducted with alcohol use as the dependent variable. However, multivariate correlation analysis revealed no significant associations between counsellor and intervention variables and alcohol use. Therefore, a post hoc decision was made to examine moderating effects on readiness to change alcohol use as the dependent variable. Readiness to change was deemed an appropriate dependent variable for the analyses of potential moderating effects of counsellor and intervention variables, because according to MI theory (Miller & Rollnick, 2013) and the transtheoretical model of behaviour change (Prochaska & DiClemente, 1983; Prochaska et al., 1992) readiness to change is assumed to be a necessary prerequisite for behaviour change. Additionally, readiness to change was the most proximate outcome variable available in the study, i.e. it was measured directly following the intervention as opposed to 3 months post intervention for alcohol use measures. Therefore, it was assumed that potential differential effects of counsellor's MI skills and of the use of different intervention components were more likely to be found on readiness to change measured directly post intervention than on alcohol use measured 3 months post intervention. Empirically, the association between readiness to change and changes in alcohol use was supported (Daepfen, Bertholet, Gmel und Gaume, 2007).

Reference. Diestelkamp S, Wartberg L, Arnaud N, Thomasius R (2016). Einfluss von Berater/-innen- und Interventionsvariablen auf die Veränderungsmotivation von Kindern und Jugendlichen nach einer motivierenden Kurzintervention zur Reduktion riskanten Alkoholkonsums. [Influence of counsellor- and intervention variables on motivation to change in children and adolescents following a brief motivational intervention to reduce risky alcohol use]. *Praxis der Kinderpsychologie und Kinderpsychiatrie*, 65, 534-549.

Results. Data of N = 5 counsellors (3 female, 2 male) with a mean age of 41.6 years (SD = 9.7) were examined in this study. Realisation of counsellors' therapeutic skills was rated by adolescents as good to very good with means of 2.5 (empathy) to 2.8 (congruence and positive affirmation) on a rating scale ranging from 0 ("totally disagree") to 3 ("totally agree"). Among the available MI tools, counsellors used the importance and confidence ruler the most (in 64.5% of BMIs), followed by the formulation of a written goal agreement (58.9%) and the use of the decisional balance exercise (39.7%). Bivariate correlations revealed statistically significant positive associations between all four therapeutic skills with readiness to change. Among the MI tools, the use of the confidence ruler and the formulation of a written goal agreement were

significantly associated with readiness to change alcohol use in the bivariate analysis. Multivariate regression analysis revealed that higher scores on the therapeutic skill “positive affirmation” (Nagelkerkes $R^2 = 7.1\%$; $p < .01$), finishing the intervention with a written goal agreement (Nagelkerkes $R^2 = 2.9\%$; $p < .05$) and younger patients' age were associated with greater readiness to change (Nagelkerkes $R^2 = 10.2\%$; $p < .01$). In total, 20.2% of the variance was explained by the variables included in the model (Nagelkerkes $R^2 = .202$, $F = 9.34$, $p < .001$). Adolescents' gender and counsellors' age and gender were not associated with readiness to change.

In sum, findings support assumptions of MI theory, because it was found that counsellor's positive affirmation most strongly predicted adolescents readiness to change alcohol use after the BMI.

5 DISCUSSION

5.1 Summary and discussion of overall results

This dissertation provided the first in-depth analysis of effectiveness and differential effectiveness of the approach of addressing adolescents ED patients with a BMI in the presumed teachable moment following an acute alcohol intoxication.

The systematic review and European evidence synthesis conducted to establish the empirical background for the research questions addressed in this dissertation was the first review to identify European evidence for this approach and the first review to support evidence on effectiveness with data on implementation, acceptance and reach of BIs for this target population. Although a considerably higher number of RCTs than in previous reviews was included (Ahmed & Mackway-Jones, 2007; Newton et al., 2013), evidence of effectiveness of BIs for this target population remained inconclusive. Participation rates varied strongly and programme acceptance was generally rated favourable, but was rarely assessed. Few publications contained information on BI implementation. Overall, the review revealed that there were substantial activities under way in Europe to provide BIs in EDs to children and adolescents following an alcohol-related event, underlining the need perceived by practitioners to offer support to this target group.

Effectiveness of the *HaLT-Hamburg* BMI (research question 1) was examined in publication IV. Contrary to hypothesis 1 of this dissertation, adolescents who received the *HaLT-Hamburg* BMI did not reduce alcohol use and alcohol-related problems stronger than adolescents who received TAU. Both intervention and control group reduced binge drinking frequency, number of drinks consumed on a typical drinking day and alcohol-related problems statistically significant at 3 and 6 months follow-up. The finding that youth across both trial conditions reduced their alcohol use significantly is consistent with findings of previous studies with adolescent ED patients (Segatto et al., 2011; Monti et al., 1999; Bernstein et al., 2010; Spirito et al., 2004; Wurdak et al., 2016). However, the many of these studies found significant effects of the intervention in subgroups (Spirito et al., 2004; Wurdak et al., 2016) or on other outcomes such as alcohol-related problems, alcohol-related injury and drinking and driving (Monti et al., 1999) or quit attempts (Bernstein et al., 2010).

In response to the exploratory research question 2, five latent classes of distinct habitual drinking patterns were interpreted in the studied sample. The analysis revealed that habitual drinking was very heterogenous within the sample with 61.2% classified as practicing low-risk drinking, two classes representing risky drinking (“moderate-risk” (5.7%) and “frequent drunk”

(15.8%)), and two classes representing high-risk drinking (“alcohol-related problems” (11.4%) and “excessive drinking” (5.1%)). Membership in the two high-risk drinking classes was associated with significantly more severe psychosocial problems, especially aggressive-dissocial behaviours. In contrast to other studies, our findings did not replicate findings on cannabis use being strongly associated with risky drinking (Reboussin et al., 2006; Wagner & Anthony, 2002). This finding is likely due to the young age of our study sample and the associated low prevalence of cannabis use. Also contrary to previous research (Grant, Stinson, & Harford, 2001), we did not find associations between drinking patterns and age or age of onset of alcohol use. The age accumulation in our sample around age 15 with relatively small variance may have resulted in the need for a larger sample size in order to detect statistically significant age differences between classes. Finally, often observed gender differences (Bouthoorn, van Hoof, & van der Lely, 2011; Chiauzzi et al., 2013) were not replicated in this study. However, our finding might be due to male and female adolescent drinking habits assimilating as recently observed in Great Britain (Healey et al., 2014). Results support prior findings (Müller et al., 2009) that a hospitalisation due to an AAI is not a sufficient indicator for habitual high-risk drinking, on the contrary, habitual drinking in this population is very heterogeneous. Findings may help counsellors to better tailor interventions to patients' needs by using the identified classes as a form of classification system for admitted adolescents.

Examination of research question 3 revealed that, contrary to hypotheses 2 & 3 of this dissertation, no differential intervention effects of patient variables, i.e. habitual drinking patterns, sociodemographic variables or psychosocial problems were found. This finding showed that the *HaLT-Hamburg* BMI was not effective in subgroups of the sample, as found in previous studies (Spirito et al., 2004; Wurdak et al., 2016). However, from the available data it cannot be made clear whether this finding reflects a missing moderating effect of the examined variables or whether this finding is due to the lack of a main effect of the intervention condition.

Regression analysis of moderating effects of counsellor and patient variables (hypotheses 4 & 5; exploratory analysis 1 & 2) revealed that interventions lead by counsellors with greater perceived positive affirmation were associated with greater readiness to change alcohol consumption. Among the MI tools tested, interventions which were concluded with a written goal setting agreement were associated with greater readiness to change, hereby confirming hypothesis 5 of the dissertation. However, it has to be noted that only a small share of variance (2.9%) could be explained by this variable. Exploratory analyses 1 & 2 revealed that the use of the decisional balance exercise and the use of the readiness and confidence ruler did not predict readiness to change in the multivariate analysis. Furthermore, younger patients' age predicted

greater readiness to change after the BI. Results support prior research pointing out the importance of counsellors' MI skills, especially positive affirmation, for eliciting motivation to change alcohol use (Gaume et al., 2009; Daeppen et al., 2010).

In sum, findings of this dissertation provide valuable information on general evidence for BMIs targeting adolescent ED patients following an alcohol-related event (publication II & IV), characteristics of the target population (publication V), and on counsellor and intervention variables associated with greater readiness to change alcohol use after the BMI (publication VI). However, null findings regarding the effectiveness of the *HaLT-Hamburg* BMI raise most questions and will therefore be discussed in particular in the following section.

5.2 Discussion of results regarding the effectiveness of the *HaLT-Hamburg* BMI

Several possible explanations may be discussed when interpreting the lack of a significant main effect of the intervention condition on alcohol use outcomes and alcohol-related problems in the *HaLT-Hamburg* trial.

One possible interpretation is that the BMI may in fact have been effective, but confounding variables and / or methodological issues prevailed analyses from detecting significant differences between groups (Jenkins, McAlaney, & McCambridge, 2009; Heather, 2014). A confounding variable often discussed for its potential to mask intervention effects under research conditions is the assessment (McCambridge & Kypri, 2011; Bischof, Freyer-Adam, Meyer, John, & Rumpf, 2012; Heather, 2014). A number of studies have observed that the mere fact of providing detailed information on e.g. alcohol use is often associated with reductions in alcohol use (McCambridge & Kyprie, 2011). In the *HaLT-Hamburg* trial assessment was extensive, lasting about 30-45 minutes, comprising a face-to-face interview and a self-report questionnaire, so that we cannot rule out the possibility that assessment procedures may have caused alcohol use reductions in the control group. Another confounding variable with the potential to (partially) mask intervention effects is what is known as a research participation effect (Heather, 2014). The awareness of participating in a research project on alcohol use may elicit or increase attention paid to drinking and thereby cause reductions. Furthermore, the statistical problem of regression to the mean, i.e. the tendency of extreme scores of a variable to exhibit a less extreme score when assessed at a second time point, may also have contributed to the difficulty of detecting effects at follow-up (Heather, 2014; McCambridge, Kypri, & McElduff, 2014).

An alternative possible interpretation for the lack of a main effect of the intervention condition in the *HaLT-Hamburg* trial is that both intervention and control group participants

reduced their drinking and alcohol-related problems as a reaction to the alcohol-related hospitalisation and the BMI did not have an additional effect. This interpretation is supported by findings that the experience of a hospitalisation may itself elicit health-related behaviour change (Boudreaux et al., 2012; Longabaugh et al., 1995; Bischof et al., 2012; Sommers et al., 2006). Conceptually, both understandings of the teachable moment as heightened intervention responsiveness and as a cueing event for behavior change can be derived from the current literature (Boudreaux et al., 2012; Lawson & Flocke, 2009).

Another hypothesis often discussed as a possible explanation for null findings in BMI studies is that counsellors' MI adherence may not have been adequate (Heather, 2014; Gaume et al., 2008). In the *HaLT-Hamburg* trial, audio-recording of the BMI sessions was not feasible, which is why we did not have the possibility to conduct an objective in-depth analysis of MI fidelity. Participants in the *HaLT-Hamburg trial* rated counsellors' empathy and positive affirmation as high to very high with an average of 2.5 (SD = 0.6) for empathy and 2.8 (SD = 0.4) for positive affirmation on a 4-point likert scale ranging from "0" (do not agree) to "3" (completely agree), supporting the notion that counsellors' MI skills were adequate. However, publication V of this dissertation also revealed that stronger positive affirmation was associated with a stronger motivation to reduce alcohol use, lending support to the hypothesis that this might be a mechanism of action possibly useful for enhancing intervention effectiveness.

Another aspect worthwhile taking into account when interpreting null findings of the *HaLT-Hamburg* trial is the fact that the BMIs were delivered within a short time frame of just a couple of hours following an AAI. Alcohol myopia theory (Steele & Josephs, 1990) posits that acute alcohol consumption impacts perception and thought in a way that information-processing is altered. Fewer situational cues can be processed at the same time and evaluation of incoming cues is impaired. Sevincer & Oettingen (2009), for example, found that study participants under the influence of alcohol evaluated the likelihood of achieving a desired goal mainly by judging desirability of the goal, disregarding feasibility of goal attainment. In the *HaLT-Hamburg* trial, the BI took place between 7 - 9 o'clock a.m., just a few hours after study participants had presented to the ED. Blood alcohol level (BAC) was not determined before BI delivery, because of concerns that this technical procedure might impair the patient-counsellor therapeutic alliance. In many cases (45.9 %) BAC was not even determined at time of ED presentation. In order to examine mental and cognitive capacity for study participation, participants were asked to repeat study procedures in their own words. However, we cannot rule out the possibility that study participants had a BAC > 0 ‰ at time of intervention delivery, possibly affecting participants' goal commitment. Future studies should therefore include BAC assessment before

BI delivery. Additionally, a stronger focus on booster sessions after discharge from hospital could provide a way to reach adolescents at later time points when myopic processes are not at work.

Finally, interpretation of the *HaLT-Hamburg* findings may benefit from looking more closely at the age-specific developmental characteristics and needs of the target population of 12 to 17 year-olds. To date, studies on BIs have widely applied BIs with the same content for adolescents and for adults. The same structure and BI elements (Segatto et al., 2011; Monti et al., 2007; Spirito et al., 2011; 2004; Dimeff et al., 1999) have been applied for adolescents and adults, thereby implicitly presuming that the same mechanisms of action in BIs apply in adult and adolescent populations. However, initial doubts have been raised whether the presumed central mechanism of action of MI, i.e. resolution of ambivalence, is as effective in adolescents as in adults (Feldstein-Ewing et al., 2016; Thush et al., 2008), because adolescents often experience little ambivalence with regard to their alcohol use (Wiers et al., 2007). Another age-specific characteristic of the target population is that adolescence is a developmental phase prone to higher incidences of risk-taking behaviours, because impulsive processes influence behaviour much stronger than in adulthood (Jessor, 1987, 1991; Wiers et al., 2010; Steinberg, 2010). According to the dual systems model of adolescent risk-taking proposed by Steinberg (2010), reward-seeking increases from pre- to mid-adolescence, whereas self-control only gradually matures from the age of around 10 years, leaving the phase of mid-adolescence especially prone to the exhibition of impulsive behaviours (Albert & Steinberg, 2011). In addition to this developmental preponderance of impulsive processes, Wiers et al. (2010) propose that habitual alcohol use as well as acute alcohol use further strengthen automatic, impulsive processes involved in risky alcohol use (see chapter 1.3). In sum, there is strong evidence that automatic, impulsive processes play a particularly influential role in excessive alcohol use during adolescence. The MI approach, however, is a rational approach to behavior change based on self-reflection and resolution of ambivalence, thereby directly addressing reflective control processes. Automatic processes are presumed to be influenced indirectly through the moderating function of reflective control processes on impulsive processes (Wiers et al., 2010; see also Figure 1, p. 6). Taking into account the presumed predominant role of automatic processes influencing adolescent alcohol use, a single MI session may not be intense enough to alter automatic processes with regard to alcohol use.

5.3 Limitations

A number of potential limitations have to be taken into account when interpreting this dissertation's findings. While the realization of the *HaLT-Hamburg* trial as an effectiveness trial (i.e. under conditions resembling real-world conditions as opposed to research-conditions) is one of the trials most important strengths, it also imposes some limitations. For example, audiorecordings of BI sessions for fidelity assessment were not conducted in order not to interfere with the establishment of a therapeutic alliance according to MI spirit. Therefore, we were not able to objectively rate MI adherence or analyse MI microskills, such as the frequency of open questions or reflective listening. However, patients rated counsellors' perceived MI skills, thereby providing a subjective measure of counsellors' MI skills from a patients' perspective which seemed an acceptable compromise. For the same reason (i.e. not to interfere with the establishment of a therapeutic alliance), BAC was not assessed prior to BI. As outlined above (chapter 5.2), according to alcohol myopia theory (Steele & Josephs, 1990), positive BAC might have impaired information-processing and goal commitment during the intervention (Sevincer & Oettingen, 2009).

Furthermore, participants and counsellors were not blinded to the assigned trial conditions, so that we cannot rule out that performance bias influenced results. However, as this bias typically leads to an overestimation of effects, it is likely that this bias did not affect results in this study. Research assistants who conducted telephone interviews for collection of follow-up data were not blinded to trial condition, because the content of the interview revealed whether the study participant had seen a counsellor during hospitalisation. However, if detection bias takes effect, it typically results in an artificial overestimation of differences between groups. Since no statistically significant differences between groups were observed in the *HaLT-Hamburg* trial, this potential source of bias can be neglected when interpreting results.

Another potential limitation of the *HaLT-Hamburg* study is that self-report data on one of the primary outcomes, number of standard drinks consumed on a typical drinking occasion, may be imprecise due to the commonly reported drinking habit of sharing one bottle of a self-made mix of spirits among a group of adolescents. This drinking habit often implies that consumers are not aware of the quantity of spirits contained in a bottle and that they have problems indicating the number of drinks consumed. Additionally, underreporting of alcohol use may have been an issue due to the retrospective assessment through self-report (Babor, Steinberg, Anton, & Del Boca, 2000). However, in order to increase quality of data, alcohol consumption data were assessed through an interview by trained research assistants in confidentiality and a non-judgemental and non-confronting way. Generally, self-report data on

alcohol use have been found to be a valid method for drinking assessment in this population (Vitale, van de Mheen, van de Weil, & Garretsen, 2006).

The sample size might have been another methodological limitation of the *HaLT-Hamburg* trial. In the intervention group ($n = 141$), we did not quite reach the sample size needed to test for a medium effect ($n = 156$). Furthermore, sample size calculation with a medium effect might have been too optimistic. The systematic review (publication II) revealed combined effects for alcohol consumption outcomes in the included studies ranging from $d = 0.19$ to $d = 0.25$, indicating small to medium effects (Döring & Bortz, 2016). Study replications with sample sizes powered for detecting small effects would be desirable. Furthermore, it has to be noted that the sample size for the *HaLT-Hamburg* trial was calculated for testing the main effect of the intervention condition and not for moderation analyses.

5.4 Implications for future research

The systematic review and European evidence synthesis (publication II) revealed a gap between implementation efforts by practitioners on the one hand and the evidence base for effectiveness of this approach on the other hand. Therefore, further research is needed to clarify the current evidence base and potentially enhance effectiveness of alcohol BMIs for adolescent AAI patients. Because the *HaLT-Hamburg* trial provided the first randomized controlled evaluation of a BMI for adolescent AAI patients, study replications would be desirable. As Heather (2014) noted, results of a single trial do not provide sufficient information to differentiate between *absence of evidence* and *evidence of absence*. It would be desirable, if study replications included larger sample sizes which would allow the detection of small effects. Additionally, replications with no-contact control groups, as recently realised by Rhodes et al. (2015) in an adult ED sample, would be desirable in order to examine possible effects of assessment and research participation on reductions in alcohol use and alcohol-related problems. Detailed and objective assessment of MI fidelity, e.g. through audiorecordings and analyses of transcripts with the Motivational Interviewing Treatment Integrity (MITI) code (Moyers, Manuel, & Ernst, 2014) or the MITI-d (Brueck et al., 2009) respectively, would also be highly desirable in future studies. Furthermore, BAC assessment prior to BI delivery would be desirable in order to examine possible effects of alcohol myopia (Steele & Josephs, 1990; Sevincer & Oettingen, 2009) on intervention effectiveness. Finally, as outlined above, considerable neuroscientific evidence and theoretical considerations support the need for a youth-specific refinement of alcohol BMIs, particularly addressing automatic, impulsive processes involved in alcohol use.

5.5 Practical implications

Against the background of the lack of evidence of effectiveness provided by the *HaLT-Hamburg* trial, one option would be to recommend de-implementation of the BMIs delivered in the nationwide *HaLT-Hart am Limit* programme. However, as outlined above, this step might be premature, since at this point, no sufficient *evidence of absence* of effectiveness was established.

While future research needs to establish further evidence on effectiveness and potentials for enhancing effectiveness, some practical implications can be derived from this dissertation's findings. Findings of the latent drinking classes analysis (research question 2) provided valuable information for counsellors delivering BMIs to adolescent AAI patients. First, knowledge about characteristics of drinking classes may facilitate individualization of interventions. In particular, interventions could be tailored to focus on characteristic drinking habits taking into account associated other substance use and psychosocial problems. Second, two screening instruments were identified which distinguish well between relevant classes. The CRAFFT-d separated well between class 1 "low-risk" (negative screening) and all other classes (positive screening) and may therefore be a useful tool to identify classes and plan interventions accordingly. Furthermore, the brief RAPI performed well in identifying the risky drinking classes 2 and 3 (positive screening, mean scores 7–9) and high-risk drinking classes 4 and 5 (mean scores 26–27). Counsellors delivering BIs for adolescent AAI patients are therefore recommended to explore different facets of habitual drinking (beyond quantity and frequency) carefully as well as to use the screening instruments CRAFFT-d and brief RAPI.

Analyses of counsellor and intervention variables (research question 3) provided a valuable contribution to the growing field of "second generation" research (Guralnick, 1993) examining potential moderators of effectiveness and mechanisms of action and thereby providing information for conceptualization of counsellors training and intervention delivery. In line with MI theory, this dissertations' findings indicate that MI skills should be a central focus of counsellor training, in particular the therapeutic skill "positive affirmation" due to its association with patients' readiness to change alcohol use. Finishing the intervention with a written goal agreement can be recommended, whereas the use of other MI tools was not associated with readiness to change.

5.6 Conclusion

The *HaLT-Hamburg* trial did not provide evidence of effectiveness for the approach of targeting adolescent AAI patients with a BMI during hospitalisation. However, current implementation practice of this approach documented the need perceived by practitioners to address this target

group with appropriate support. While some practical implications for intervention delivery were derived from this dissertation, future research is needed in order to enhance effectiveness of this approach.

REFERENCES

- Aalto, M., Seppä, K., Mattila, P., Mustonen, H., Ruuth, K., Hyvärinen, H., Pulkkinen, H., Alho, H., & Sillanaukee, P. (2001). Brief intervention for male heavy drinkers in routine general practice: a three-year randomized controlled study. *Alcohol and Alcoholism, 36*(3), 224–230.
- Ahmed, M., & Mackway-Jones, K. (2007). Towards evidence based emergency medicine: best BETs from the Manchester Royal Infirmary. Is ED based brief intervention worthwhile in children and adolescents presenting with alcohol-related events? *Emergency Medicine Journal, 24*, 125–128.
- Albert, D. & Steinberg, L. (2011). Age Differences in Strategic Planning as Indexed by the Tower of London. *Child Development, 82*(5), 1501–1517.
- Alcohol and Public Policy Group (2010). Alcohol- no ordinary commodity - a summary of the second edition. *Addiction, 105*(5), 769-79.
- Apodaca, T. R. & Longabaugh, R. (2009). Mechanisms of change in motivational interviewing: a review and preliminary evaluation of the evidence. *Addiction, 104*, 705–715.
- Arkowitz, H., Miller, W. R., Westra, H. A., & Rollnick, S. (2008). Motivational interviewing in the treatment of psychological problems. Conclusions and future directions. In: H. Arkowitz, H. A. Westra, W. R. Miller, & S. Rollnick (Eds.), *Motivational interviewing in the treatment of psychological problems* (pp. 324-342). New York, NY: Guilford Press.
- Babor, T. F. (1994). Avoiding the horrid and beastly sin of drunkenness: does dissuasion make a difference? *Journal of Consulting and Clinical Psychology, 62*(6), 1127–1140.
- Babor, T. F., Steinberg, K., Anton, R., & Del Boca, F. (2000). Talk is cheap: measuring drinking outcomes in clinical trials. *Journal of Studies on Alcohol and Drugs, 61*, 55-63.
- Barnett, N. P., Apodaca, T. R., Magill, M., Colby, S. M., Gwaltney, C., Rohsenow, D. J., & Monti, P. M. (2010). Moderators and mediators of two brief interventions for alcohol in the emergency department. *Addiction, 105*(3), 452-465.
- Barnett, N. P., Lebeau-Craven, R., O'Leary, T. A., Colby, S. M., Woolard, R., Rohsenow, D. J., Spirito, A., & Monti, P. M. (2002). Predictors of motivation to change after

- medical treatment for drinking-related events in adolescents. *Psychology of Addictive Behaviours*, *16*(2), 106-112.
- Baumeister, R. F. & Vohs, K. D. (2007b). Self-regulation, ego depletion, and motivation. *Social and Personality Psychology Compass*, *1*(1), 115-128.
- Baumeister, R. F., Vohs, K. D., & Tice, D. M. (2007a). The strength model of self-control. *Current Directions in Psychological Science*, *16*, 351–355.
- Becker, S. J., Spirito, A., Hernandez, L., Barnett, N. P., Eaton, C. A., Lewander, W., Rohsenow, D. J., & Monti, P. M. (2012). Trajectories of adolescent alcohol use after brief treatment in an Emergency Department. *Drug and Alcohol Dependence*, *125*(1-2), 103–109.
- Bernstein, J., Heeren, T., Edward, E., Dorfman, D., Bliss, C., Winter, M., & Bernstein, E. (2010). A Brief Motivational Interview in a Pediatric Emergency Department, Plus 10-day Telephone Follow-up, Increases Attempts to Quit Drinking among Youth and Young Adults Who Screen Positive for Problematic Drinking. *Academic Emergency Medicine*, *17*, 890–902.
- Bertholet, N., Palfai, T., Gaume, J., Daepfen, J. B., & Saitz, R. (2014). Do brief alcohol motivational interventions work like we think they do? *Alcoholism: Clinical and Experimental Research*, *38*(3), 853–859.
- Bischof, G., Freyer-Adam, J., Meyer, C., John, U., & Rumpf, H.-J. (2012). Changes in drinking behavior among control group participants in early intervention studies targeting unhealthy alcohol use recruited in general hospitals and general practices. *Drug and Alcohol Dependence*, *125*, 81– 88.
- Bitunjac, K., & Saraga, M. (2009). Alcohol intoxication in pediatric age: Ten-year retrospective study. *Croatian Medical Journal*, *50*, 151–156.
- Blow, F. C., Ilgen, M. A., Walton, M. A., Czyz, E. K., McCammon, R., Chermack, S. T., Cunningham, R. M., & Barry, K. L. (2009). Severity of baseline alcohol use as a moderator of brief interventions in the emergency department. *Alcohol and Alcoholism*, *44*(5), 486-90.
- Bohnert, K. M., Walton, M. A., Resko, S., Barry, K. T., Chermack, S. T., Zucker, R. A., Zimmerman, M. A., Booth, B. M., & Blow, F. C. (2014). Latent class analysis of substance use among adolescents presenting to urban primary care clinics. *American Journal of Drug and Alcohol Abuse*, *40*(1), 44-50.
- Boudreaux, E. D., Bock, B., & O`Hea, E. (2012). When an Event Sparks Behaviour Change: An Introduction to the Sentinel Event Method of Dynamic Model Building

- and Its Applications to Emergency Medicine. *Academic Emergency Medicine*, 19, 329-335.
- Brueck, R. K., Frick, F., Loessl, B., Kriston, L., Schondelmaier, S., Go, C., Haerter, M., & Berner, M. (2009). Psychometric properties of the German version of the Motivational Interviewing Treatment Integrity Code. *Journal of Substance Abuse Treatment*, 36, 44–48.
- Burke, B. L., Arkowitz, H., & Menchola, M. (2003). The efficacy of motivational interviewing: A meta-analysis of controlled clinical trials. *Journal of Consulting and Clinical Psychology*, 71(5), 843-861.
- Cafilisch, M. & Uldry, V. (2013). At the crossover of adolescent and alcohol. *Revue Medicale Suisse*, 9, 406-409.
- Carey, K. B., Henson, J. M., Carey, M. P., & Maisto, S. A. (2007b). Which Heavy Drinking College Students Benefit From a Brief Motivational Intervention? *Journal of Consulting and Clinical Psychology*, 75(4), 663–669.
- Carey, K. B., Scott-Sheldon, L. A. J., Carey, M. P., & DeMartini, K. S. (2007a). Individual-level interventions to reduce college student drinking: a meta-analytic review. *Addictive Behaviours*, 32, 2469-2495.
- Chiauzzi, E., DasMahapatra, P., & Black, R. A. (2013). Risk behaviours and drug use: A latent class analysis of heavy episodic drinking in first-year college students. *Psychology of Addictive Behaviour*, 27(4), 974-985.
- Cochran, G., Field, C., & Caetano, R. (2014). Injury-Related Consequences of Alcohol Misuse Among Injured Patients Who Received Screening and Brief Intervention for Alcohol: A Latent Class Analysis. *Substance Abuse*, 35(2), 153-162.
- Cochrane Effective Practice and Organisation of Care Group (EPOC) (2002). *The Data Collection Checklist*. Ottawa: Cochrane Effective Practice and Organisation of Care Group (EPOC).
- Cooper, M. L., Frone, M. R., Russell, M., & Mudar, P. (1995). Drinking to regulate positive and negative emotions: a motivational model of alcohol use. *Journal of Personality and Social Psychology*, 69, 990–1005.
- Cox, W. M. & Klinger, E. (2004). A motivational model of alcohol use: Determinants of use and change. In W. M. Cox & E. Klinger (Eds.), *Handbook of motivational counseling* (pp. 121-138). Chichester: John Wiley & Sons Ltd.
- Daeppen J. B., Bertholet, N., Gmel, G., & Gaume, J. (2007). Communication During Brief Intervention, Intention to Change, and Outcome. *Substance Abuse*, 28(3), 43-51.

- Daepfen, J. B. (2008). A meta-analysis of brief alcohol interventions in emergency departments: Few answers, many questions - Commentary. *Addiction*, *103*(3), 377-378.
- Deas, D., Riggs, P., Langenbucher, J., Goldman, M., & Brown, S. (2000). Adolescents are not adults: Developmental considerations in alcohol users. *Alcoholism: Clinical and Experimental Research*, *24*, 232-237.
- Delphi (2010). *Evaluation des 'NachHaLT'-Projektes in Berlin – Ergebnisbericht*. *Evaluation of the project 'NachHaLT' in Berlin – final report, 2010*. Retrieved from http://www.halt-berlin.de/tl_files/nachhalt/bilder/PDF/NachHaLT_Evaluation_Ergebnisbericht_delphi_Nov2010.pdf.
- Dhital, R., Norman, I., Whittlesea, C., & McCambridge, J. (2013). Effectiveness of alcohol brief intervention delivered by community pharmacists: study protocol of a two-arm randomised controlled trial. *BMC Public Health*, *13*, 152.
- Dimeff, L. A., Baer, J. S., Kivlahan, D. R., & Marlatt, G. A. (1999). *Brief Alcohol Screening and Intervention for College Students (BASICS). A Harm Reduction Approach*. New York: The Guilford Press.
- Döring, N., & Bortz, J. (2016). *Forschungsmethoden und Evaluation in den Sozial- und Humanwissenschaften*. Berlin, Heidelberg: Springer.
- Earleywine, M., LaBrie, J. W., & Pedersen, E. R. (2008). A brief Rutgers Alcohol Problem Index with less potential for bias. *Addictive Behaviours*, *33*(9), 1249-1253.
- Emmen, M. J., Schippers, G. M., Bleijenberg, G., & Wollersheim, H. (2004). Effectiveness of opportunistic brief interventions for problem drinking in a general hospital setting: systematic review. *British Medical Journal*, *328* (7435), 318.
- European Monitoring Centre for Drugs and Drug Addiction (2016), *Emergency department-based brief interventions for individuals with substance-related problems: a review of effectiveness*, EMCDDA Papers, Publications Office of the European Union, Luxembourg.
- Fandler, E., Scheer, P., Rödl, S., & Müller, W. (2008). Alkoholmissbrauch und -abhängigkeit bei Kindern und Jugendlichen [Alcohol misuse and dependence in children and adolescents]. *Monatsschrift Kinderheilkunde*, *156*, 591-604.
- Feldstein Ewing, S. W., Apodaca, T. R., & Gaume, J. (2016). Ambivalence: Prerequisite for success in motivational interviewing with adolescents? *Addiction*, *111*(11), 1900-1907.

- Feldstein Ewing, S. W., LaChance, H. A., Bryan, A., & Hutchison, K. E. (2009). Do genetic and individual risk factors moderate the efficacy of motivational enhancement therapy? Drinking outcomes with an emerging adult sample. *Addiction Biology, 14*, 356–365.
- Feldstein, S. W. & Forcehimes, A. A. (2007). Motivational interviewing with underage college drinkers: A preliminary look at the role of empathy and alliance. *The American Journal of Drug and Alcohol Abuse, 33*(5), 737-746.
- Fenzl, T., Mayring, P., Drobesh-Binter, B., Moshitz, C., & Gschwendner, A. (n.d.). Grenzwert: Praktische Erfahrungen zur Prävention von riskantem Alkoholkonsum bei Jugendlichen in Kärnten [Bordeline: Practical experiences in the prevention of risky alcohol consumption in adolescents in Carinthia]. *Unpublished manuscript*, 1–21.
- Field, C. A., Baird, J., Saitz, R., Caetano, R., & Monti, P. (2010). The Mixed Evidence for Brief Intervention in Emergency Departments, Trauma Care Centers, and Inpatient Hospital Settings: What Should We Do? *Alcoholism: Clinical and Experimental Research, 34*(12), 2004–2010.
- Forsythe, M., & Lee, G. A. (2012). The evidence for implementing alcohol screening and intervention in the emergency department – Time to act. *International Emergency Nursing, 20*(3), 167-72.
- Foxcroft, D. R., Coombes, L., Wood, S., Allen, D., & Almeida Santimano, N. M. L. (2014). Motivational interviewing for alcohol misuse in young adults. *Cochrane Database of Systematic Reviews, 8*, Art.No.:CD007025.
- Gaume, J., Gmel, G., & Daepfen, J. B. (2008). Brief alcohol interventions: do counsellors' and patients' communication characteristics predict change? *Alcohol and Alcoholism, 43*(1), 62–69.
- Gaume, J., Gmel, G., Faouzi, M., & Daepfen, J. B. (2009). Counselor skill influences outcomes of brief motivational interventions. *Journal of Substance Abuse Treatment, 37*, 151–159.
- Gaume, J., McCambridge, J., Bertholet, N., & Daepfen, J. (2014a). Mechanisms of action of brief alcohol interventions remain largely unknown – a narrative review. *Frontiers in Psychiatry, 5*(108), 1-9.
- Gaume, J., Magill, M., Longabaugh, R., Bertholet, N., Gmel, G., & Daepfen, J. B. (2014b). Influence of counselor characteristics and behaviors on the efficacy of a brief

- motivational intervention for heavy - A randomized controlled trial. *Alcoholism: Clinical and Experimental Research*, 38(7), 2138-47.
- Gesundheitsberichterstattung des Bundes (2016). *Diagnosedaten der Krankenhäuser ab 2000; 2016. Aus dem Krankenhaus entlassene vollstationäre Patienten (einschl. Sterbe- und Stundenfälle) F10.0 – Psychische und Verhaltensstörungen durch Alkohol - Akute Intoxikation (akuter Rausch) nach Wohnsitz, Alter und Geschlecht* [Fallzahl und je 100 000 Einwohner]. Retrieved from <http://www.gbe-bund.de>.
- Glasgow, R. E., Vogt, T. M., & Boles, S. M. (1999). Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *American Journal of Public Health*, 89, 1322–1327.
- Gollwitzer, P. M. (2012). Mindset theory of action phases. In P. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories in social psychology* (Vol. 1, pp. 526-545). London: Sage Publications.
- Grant, B.F., Stinson, F.S., & Harford, T.C. (2001). Age at onset of alcohol use and DSM-IV alcohol abuse and dependence. A 12-year follow-up. *Journal of Substance Abuse*, 13, 493–504.
- Guralnick, M. J. (1993). Second generation research on the effectiveness of early intervention. *Early Education and Development*, 4, 366–78.
- Hampel, P. & Petermann, F. (2005). *SPS-J - Screening psychischer Störungen im Jugendalter. Deutschsprachige Adaptation des Reynolds Adolescent Adjustment Screening Inventory™ (RAASITM) von William M. Reynolds [SPS-J - Screening of psychological disorders in adolescence. German adaptation of the Reynolds Adolescent Adjustment Screening Inventory™ (RAASITM) by William M. Reynolds]*. Goettingen: Hogrefe.
- Härter, M., Kentgens, M., Brandes, A., Bock, T., Dirmaier, J., Erzberger, ... Lambert, M. (2012). Rationale and content of psychenet: The Hamburg network for mental health. *European Archives of Psychiatry and Clinical Neuroscience*, 262(2), 57-63.
- Hayes, A. (2013). *Introduction to Mediation, Moderation, and Conditional Process Analysis. A Regression-Based Approach*. New York: The Guilford Press.
- Healey, C., Rahmana, A., Faizal, M., & Kinderman, P. (2004). Underage drinking in the UK: Changing trends, impact and interventions. A rapid evidence synthesis. *International Journal of Drug Policy*, 25, 124–132.
- Heather, N. (2014). Interpreting null findings from trials of alcohol brief interventions. *Frontiers in Psychiatry*, 5, 1-11.

- Heidenreich, T., & Hoyer, J. (2001). Stadien der Veränderung bei Substanzmissbrauch und -abhängigkeit: Eine methodenkritische Übersicht [Stages of change in addictive behaviors: A methodological overview]. *Sucht* 2001, 47(3), 158–170.
- Herring, R., Berridge, V., & Thom, B. (2008). Binge drinking: an exploration of a confused concept. *Journal of Epidemiology and Community Health*, 62, 476–479.
- Hibell, B., Guttormsson, U., Ahlström, S., Balakireva, O., Bjarnason, T., Kokkevi, A., & Kraus, L. (2012). *The 2011 ESPAD Report. Substance use among students in 36 European countries*. Retrieved from http://www.espad.org/Uploads/ESPAD_reports/2011/The_2011_ESPAD_Report_FULLL_2012_10_29.pdf.
- Higgins, J. P. T., & Green, S. (2011). *Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 (updated March 2011)*. The Cochrane Collaboration, 2011. Retrieved from <http://www.cochranehandbook.org>.
- Hingson, R. W., Heeren, T., & Winter, M. (2006). Age at drinking onset and alcohol dependence: Age at onset, duration, and severity. *Archives of Pediatric and Adolescent Medicine*, 160, 739-746.
- Hingson, R., Heeren, T., Zakocs, R. & Winter, M. (2002). Age of first intoxication, heavy drinking, driving after drinking and risk of unintentional injury. *Journal of Studies on Alcohol*, 63, 136-144.
- IBM Corp. (2012). *IBM SPSS Statistics for Windows, Version 21.0*. Armonk, NY: IBM Corp.
- Jenkins, R. J., McAlaney, J., & McCambridge, J. (2009). Change over time in alcohol consumption in control groups in brief intervention studies: systematic review and meta-regression study. *Drug and Alcohol Dependence*, 100, 107-14.
- Jensen, C. D., Cushing, C. C., Aylward, B. S., Craig, J. T., Sorell, D. M., & Steele, R. G. (2011). Effectiveness of Motivational Interviewing Interventions for Adolescent Substance Use Behavior Change: A Meta-Analytic Review. *Journal of Consulting and Clinical Psychology*, 79 (4), 433–440.
- Jessor, R., & Jessor, S. L. (1977). *Problem behavior and psychosocial development: A longitudinal study of youth*. New York, NY: Academic Press.
- Jessor, R. (1987). Problem-behaviour theory, psychosocial development, and adolescent problem drinking. *British Journal of Addiction*, 82, 331-342.
- Jessor, R. (1991). Risk behavior in adolescence: A psychosocial framework for understanding and action. *Journal of Adolescent Health*, 12, 597-605.

- Kaner, E. F. (2010). Commentaries on Nilsen (2010). Brief alcohol intervention: time for translational research. *Addiction*, *105*, 960-965.
- Kaner, E. F., Dickinson, H. O., Beyer, F. R., Campbell, F., Schlesinger, C., Heather, N.,... Pienaar, E. D. (2007). Effectiveness of brief alcohol interventions in primary care populations. *The Cochrane Database Systematic Reviews*.
- Kohler, S., & Hofmann, A. (2015). Can motivational interviewing in emergency care reduce alcohol consumption in young people? A systematic review and meta-analysis. *Alcohol & Alcoholism*, *50*(2), 107-17.
- Köpetz, C. E., Lejuez, C. W., Wiers, R. W., & Kruglanski, A. W. (2013). Motivation and Self-Regulation in Addiction: A Call for Convergence. *Perspectives on Psychological Science*, *8*(1), 3–24.
- Kraemer, H. C., Kiernan, M., Essex, M., & Kupfer, D. J. (2008). How and why criteria defining moderators and mediators differ between the Baron & Kenny and MacArthur approaches. *Health Psychology*, *27*(2), *Suppl*, 101–108.
- Krupski, A., Sears, J. M., Joesch, J. M., Estee, S., He, L., Huber, A., Dunn, C., Roy-Byrne, P., & Ries, R. (2012). Self-reported alcohol and drug use six months after brief intervention: do changes in reported use vary by mental-health status? *Addiction Science & Clinical Practice*, *7*:24.
- Kuntsche, E., Gabhainn, S. N., Roberts, C., Windlin, B., Vieno, A., Bendtsen, P., ... Wicki, M. (2014). Drinking motives and links to alcohol use in 13 European countries. *Journal of Studies on Alcohol and Drugs*, *75*(3), 428-37.
- Kuttler, H. (2006). Hart am Limit – HaLT: Ein Alkoholpräventionsprojekt fuer Kinder und Jugendliche. *Suchtmedizin in Forschung und Praxis*, *8*(1), 45–50.
- Kuzelová, M., Harárová, A., Ondriasová, E., Wawruch, M., Riedel, R., Benedeková, M., et al. (2009). Alcohol intoxication requiring hospital admission in children and adolescents: Retrospective analysis at the University Children's Hospital in the Slovak Republic. *Clinical Toxicology (Philadelphia, Pa.)*, *47*(6), 556–561.
- Lawson, P. J. & Flocke, S. A. (2009). Teachable moments for health behaviour change: a concept analysis. *Patient Education and Counseling*, *76*, 25–3026.
- Lee, C. S., Baird, J., Longabaugh, R., Nirenberg, T. D., Mello, M. J., & Woolard, R. (2010). Change plan as an active ingredient of brief motivational interventions for reducing negative consequences of drinking in hazardous drinking emergency-department patients. *Journal of Studies on Alcohol and Drugs*, *71*(5), 726–33.

- Lim, S. S., Vos, T., Flaxman, A. D., Danaei, G., Shibuya, K., Adair-Rohani, H.,... Ezzati, M. (2012). A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *The Lancet*, 380, 2224-2260.
- Longabaugh, R., Minugh, P. A., Nirenberg, T. D., Clifford, P. R., Becker, B., & Woolard, R. (1995). Injury as a motivator to reduce drinking. *Academic Emergency Medicine*, 2(9), 817-25.
- Loukova, A. (2011). Study of acute alcohol poisoning in children admitted to an emergency hospital Pirogov in Sofia, Bulgaria. *Macedonian Journal of Medical Sciences*, 4(3), 275–280.
- MacKillop, J., & Kahler, C. W. (2009). Delayed reward discounting predicts treatment response for heavy drinkers receiving smoking cessation treatment. *Drug and Alcohol Dependence*, 104, 197–203.
- Magill, M., Gaume, J., Apodaca, T. R., Walthers, J., Mastroleo, N. R., Borsari, B., & Longabaugh, R. (2014). The Technical Hypothesis of Motivational Interviewing: A Meta-Analysis of MI's Key Causal Model. *Journal of Consulting and Clinical Psychology*, 82(6), 973-983.
- Maio, R. F., Shope, J. T., Blow, F. C., Copeland, L. A., Gregor, M. A., Brockmann, L. M., Weber, J. E., & Metrou, M. E. (2000). Adolescent injury in the emergency department: opportunity for alcohol interventions? *Annals of Emergency Medicine*, 35, 252-257.
- McCambridge, J. (2013). Brief intervention content matters. *Drug and Alcohol Review*, 32, 339–341.
- McCambridge, J., & Kypri, K. (2011). Can Simply Answering Research Questions Change Behaviour? Systematic Review and Meta Analyses of Brief Alcohol Intervention Trials. *PLoS ONE* 6(10), e23748.
- McCambridge, J., Kypri, K., & McElduff, P. (2014). Regression to the mean and alcohol consumption: A cohort study exploring implications for the interpretation of change in control groups in brief intervention trials. *Drug and Alcohol Dependence* 135, 156– 159.
- McCutcheon, A. L. (1987). *Latent Class Analysis*. Newbury Park: Sage.

- McNally, A. M., Palfai, T. P., & Kahler, C. W. (2005). Motivational interventions for heavy drinking college students: examining the role of discrepancy-related psychological processes. *Psychology of Addictive Behaviours, 19*(1), 79–87.
- McQueen, J., Howe, T. E., Allan, L., Mains, D., & Hardy, V. (2011). Brief interventions for heavy alcohol users admitted to general hospital wards. *Cochrane Database of Systematic Reviews*, Issue 8. Art. No.: CD005191.
- Miller, J. W., Naimi, T. S., Brewer, R. D., & Jones, S. E. (2007). Binge drinking and associated health risk behaviours among high school students. *Journal of Pediatrics, 119*(1), 76-85.
- Miller, R. W. (1999). *Enhancing Motivation for Change in Substance Abuse Treatment. Treatment Improvement Protocol (TIP) Series 35*. Rockville: U.S. Department of Health and Human Services.
- Miller, W. R., & Rollnick, S. (2002). *Preparing people for change (2nd ed)*. New York: The Guilford Press.
- Miller, W. R., & Rollnick, S. (2013). *Preparing people for change (3rd ed)*. New York: The Guilford Press.
- Miller, W. R., & Rose, G. S. (2015). Motivational interviewing and decisional balance: Contrasting responses to client ambivalence. *Behavioural and Cognitive Psychotherapy, 43*, 129–41.
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & PRISMA Group (2009). Preferred reporting items for systematic reviews and meta-analysis: the PRISMA statement. *Open Med, 3*, 123-130.
- Monti, P. M., Barnett, N. P., Colby, S. M., Gwaltney, C. J., Spirito, A., Rohsenow, D. J., & Woolard, R. (2007). Motivational interviewing versus feedback only in emergency care for young adult problem drinking. *Addiction, 102*, 1234–1243.
- Monti, P. M., Colby, S. M., Barnett, N. P., Spirito, A., Rohsenow, D. J., Myers, M., Woolard, R., & Lewander, W. (1999). Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital emergency department. *Journal of Consulting and Clinical Psychology, 67*, 989–994.
- Moyers, T. B., Manuel, J. K., & Ernst, D. (2014). *Motivational Interviewing Treatment Integrity Coding Manual 4.1*. Unpublished manual. Retrieved from http://casaa.unm.edu/download/MITI4_1.pdf. Retrieved: 07-12-2016.

- Moyers, T. B., Martin, T., Houck, J. M., Christopher, P. J., & Tonigan, J. S. (2009). From In-Session Behaviors to Drinking Outcomes: A Causal Chain for Motivational Interviewing. *Journal of Consulting and Clinical Psychology, 77*(6), 1113–1124.
- Müller, S., Pabst, A., Krohthaler, F., Grübel, A., Kraus, L., Burdach, S., et al. (2009). Akute Alkoholvergiftung bei Jugendlichen – Erste Ergebnisse eines Münchener Pilotprojekts. *Deutsche Medizinische Wochenschrift, 21*, 1101–1105.
- Muthén, L. K. & Muthén, B. O. (2011). *Mplus User's Guide. Sixth Edition*. Los Angeles: Muthén & Muthén.
- Newton, A. S., Gokiert, R., Mabood, N., Ata, N., Dong, K., Ali, S., ... Wild, T. C. (2013). Brief emergency department interventions for youth who use alcohol and other drugs: a systematic review. *Pediatric Emergency Care, 29*(5), 673-84.
- Nilsen, P. (2010). Brief alcohol intervention - where to from here? Challenges remain for research and practice. *Addiction, 105*, 954-959.
- Nilsen, P., Baird, J., Mello, M., Nirenberg, T., Woolard, R., Bendtsen, P., & Longabaugh, R. (2008). A systematic review of emergency care brief alcohol interventions for injury patients. *Journal of Substance Abuse Treatment, 35*, 184–201.
- O'Donnell, A., Anderson, P., Newbury-Birch, D., Schulte, B., Schmidt, C., Reimer, J., & Kaner, E. (2014). The Impact of Brief Alcohol Interventions in Primary Healthcare: A Systematic Review of Reviews. *Alcohol and Alcoholism, 49*(1), 66–78.
- Oettingen, G. & Gollwitzer, P. M. (2015). Self-regulation: Principles and tools. In G. Oettingen & P. M. Gollwitzer (Eds.), *Self-regulation in adolescence* (pp. 3-29). New York: Cambridge University Press.
- Orth, B., & Töppich, J. (2015). Der Alkoholkonsum Jugendlicher und junger Erwachsener in Deutschland 2014. *Ergebnisse einer aktuellen Repräsentativbefragung und Trends*. Bundeszentrale für gesundheitliche Aufklärung, Köln.
- Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: toward an integrative model of change. *Journal of Consulting and Clinical Psychology, 51*(3), 390–395.
- Prochaska, J. O., DiClemente, C. C., & Norcross J. C. (1992). In Search of How People Change. Applications to Addictive Behaviors. *American Psychologist, 47*(9), 1102-1114.
- Prognos (2008). *Wissenschaftliche Begleitung des Bundesmodellprogramms 'HaLT – Hart am Limit'*, 2008. Retrieved from http://www.halt-coburg.de/files/halt-projekt_endbericht.pdf.

- Ray, A. E., Stapleton, J. L., Turrisi, R., & Pillion, E. (2012). Patterns of drinking-related protective and risk behaviours in college student drinkers. *Addictive Behaviours, 37*, 449–455.
- Reboussin, B. A., Songa, E. U., Shrestha, A., Lohmana, K. K., & Wolfson, M. (2006). A latent class analysis of underage problem drinking: Evidence from a community sample of 16–20 year olds. *Drug and Alcohol Dependence, 83*, 199-209.
- Rhodes, K. V., Rodgers, M., Sommers, M., Hanlon, A., Chittams, J., Doyle, A., Datner, E., & Crits-Christoph, P. (2015). Brief Motivational Intervention for Intimate Partner Violence and Heavy Drinking in the Emergency Department: A Randomized Clinical Trial. *JAMA, 314*(5), 466-477.
- Sack, P. M., Diestelkamp, S., Küstner, U., & Thomasius, R. (2012). Gesundheitsnetz "Alkoholmissbrauch im Jugendalter": Verbesserung des Behandlungszugangs fuer Kinder und Jugendliche mit riskantem Alkoholkonsum. [Health network "alcohol abuse in adolescence": Improved access-to-care for children and adolescents with at-risk alcohol use]. *Suchttherapie, 13*(1), 33-36.
- Saitz, R., Palfai, T. P., Cheng, D. M., Horton, N. J., Dukes, K., Kraemer, K. L., ... Samet, J. H. (2009). Some medical inpatients with unhealthy alcohol use may benefit from brief intervention. *Journal of Studies on Alcohol & Drugs, 70*(3), 426-35.
- Saunders, J. B., Aasland, O. G., Babor, T. F., de la Fuente, J. R., & Grant, M. (1993). Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption–II. *Addiction, 88*(6), 791–804.
- Segatto, M. L., Andreoni, S., de Souza e Silva, R., Diehl, A., & Pinsky, I. (2011). Brief motivational interview and educational brochure in emergency room settings for adolescents and young adults with alcohol-related problems: a randomized single-blind clinical trial. *Revista Brasileira de Psiquiatria, 33*, 225–233.
- Sevincer, A. T., & Oettingen, G. (2009). Alcohol breeds empty goal commitments. *Journal of Abnormal Psychology, 118*, 623-633.
- Sindelar, H. A., Barnett, N. P., & Spirito, A. (2004). Adolescent alcohol use and injury: A summary and critical review of the literature. *Minerva Pediatrica, 56*(3), 291-309.
- Sommers, M. S., Dyehouse, J. M., Howe, S. R., Fleming, M., Fargo, J. D., & Schafer, J. C. (2006). Effectiveness of Brief Interventions after Alcohol-Related Vehicular Injury: A Randomized Controlled Trial. *Journal of Trauma, 61*, 523–533.

- Spirito, A., Monti, P. M., Barnett, N. P., Colby, S. M., Sindelar, H., Rohsenow, D. J., Lewander, W., & Myers, M. (2004). A randomized clinical trial of a brief motivational intervention for alcohol-positive adolescents treated in an emergency department. *Journal of Pediatrics, 145*, 396–402.
- Spirito, A., Sindelar-Manning, H., Colby, S. M., Barnett, N. P., Lewander, W., Rohsenow, D. J., & Monti, P. M. (2011). Individual and family motivational interventions for alcohol-positive adolescents treated in an emergency department: results of a randomized clinical trial. *Archives of Pediatric and Adolescent Medicine, 165*, 269–274.
- Steele, C. M., & Josephs, R. A. (1990). Alcohol myopia: its prized and dangerous effects. *American Psychologist, 45*(8), 921–933.
- Steinberg, L. (2010). A dual systems model of adolescent risk-taking. *Developmental Psychobiology, 52*, 216–224.
- Stolle, M., Sack, P. M., Broening, S., Baldus, C., & Thomasius, R. (2013). Brief Intervention in alcohol intoxicated adolescent – a follow-up study in an access to-care sample. *Journal of Alcoholism and Drug Dependence, 1*, 106.
- Strack, F. & Deutsch, R. (2004). Reflective and impulsive determinants of social behaviour. *Personality and Social Psychology Review, 8*, 220–247.
- Stucki, C. (2004). *Die Therapiebeziehung differentiell gestalten. Intuitive Reaktionen, Patientenwahrnehmung und Beziehungsverhalten von Therapeuten in der Psychotherapie [Creating differential therapeutic alliances. Intuitive reactions, patient perception and therapeutic alliance in psychotherapy]*. University of Bern. Retrieved from http://www.zb.unibe.ch/download/eldiss/04stucki_c.pdf.
- Tanner-Smith, E. E., & Lipsey, M. W. (2015). Brief Alcohol Interventions for Adolescents and Young Adults: A Systematic Review and Meta-Analysis. *Journal of Substance Abuse Treatment, 51*, 1–18.
- Thush, C., Wiers, R., Ames, S., Grenard, J., Susman, S., & Stacy, A. (2008). Interactions between implicit and explicit cognition and working memory capacity in the prediction of alcohol use in at-risk adolescents. *Drug and Alcohol Dependence, 94*, 116–124.
- Tossmann, P., Kasten, L., Lang, P., & Strüber, E. (2009). Bestimmung der konkurrenten Validität des CRAFFT-d. Ein Screeninginstrument für problematischen Alkoholkonsum bei Jugendlichen. *Zeitschrift für Kinder- und Jugendpsychiatrie und Psychotherapie, 37*, 451–459.

- Tripodi, S., Bender, K., Litschge, C., & Vaughn, M. G. (2010). Interventions for Reducing Adolescent Alcohol Abuse. *Archives of Pediatrics and Adolescent Medicine*, *164*(1), 85-91.
- Van Hoof, J. J., Van Der Lely, N., Pereira, R. R., & Van Dalen, W. E. (2010). Adolescent alcohol intoxication in the dutch hospital Departments of Pediatrics. *Journal of Studies on Alcohol and Drugs*, *71*(3), 366-372.
- Vasilaki, E., Hosier, S., & Cox, W. M. (2006). The efficacy of motivational interviewing as a brief intervention for excessive drinking: A meta-analytic trial. *Alcohol and Alcoholism*, *41*(3), 328–335.
- Viner, R. M., & Taylor, B. (2007). Adult outcomes of binge drinking in adolescence: Findings from a UK national birth cohort. *Journal of Epidemiology and Community Health*, *61*, 902-907.
- Vitale, S. G., van de Mheen, H., van de Weil, A., & Garretsen, H. F. (2006). Substance use among emergency room patients: is self-report preferable to biochemical markers? *Addictive Behaviours*, *31*, 1661–1669.
- Vonghia, L., Leggio, L., Ferrulli, A., Bertini, M., Gasbarrini, G., Addolorato, G., & Alcoholism Treatment Study Group (2008). Acute alcohol intoxication. *European Journal of Internal Medicine*, *19*, 561–567
- Wachtel, T., & Staniford, M. (2010). The effectiveness of brief interventions in the clinical setting in reducing alcohol misuse and binge drinking in adolescents: A critical review of the literature. *Journal of Clinical Nursing*, *19*(5-6), 605-620.
- Wagner, F.A., & Anthony, J.C. (2002). Into the world of illegal drug use: Exposure opportunity and other mechanisms linking the use of alcohol, tobacco, marijuana, and cocaine. *American Journal of Epidemiology*, *155*, 918–925.
- Walton, M. A., Chermack, S. T., Shope, J. T., Bingham, C. R, Zimmerman, M. A., Blow, F. C., & Cunningham, R. M. (2010). Effects of a Brief Intervention for Reducing Violence and Alcohol Misuse Among Adolescents A Randomized Controlled Trial. *JAMA*, *304*(5), 527-535.
- Walton, M. A., Goldstein, A. L., Chermack, S. T., McCammon, R. J., Cunningham, R. M., Barry, K. L., & Blow, F. C. (2008). Brief alcohol intervention in the emergency department: moderators of effectiveness. *Journal of Studies on Alcohol and Drugs*, *69*(4), 550 –560.
- Wechsler, H., Davenport, A., Dowdall, G. W., Moeykens, B., & Castillo, S. (1994). Health and behavioural consequences of binge drinking in college – a national survey of

- students at 140 campuses. *Journal of the American Medical Association*, 272, 1671-1677.
- Wechsler, H., Kuo, M., Lee, H., & Dowdall, G. W. (2000). Environmental correlates of underage alcohol use and related problems of college students. *American Journal of Preventive Medicine*, 19, 24–29.
- Wiers, R. W., Ames, S. L., Hofmann, W., Krank, M., & Stacey, A. W. (2010). Impulsivity, impulsive and reflective processes and the development of alcohol use and misuse in adolescents and young adults. *Frontiers in Psychology*, 1 (144), 1-12.
- Wiers, R. W., Bartholow, B. D., Van den Wildenberge, E., Thush, C., Engels, R. C. M. E., Sher, K. J., Grenard, J., Ames, S. L., & Stacey, A. W. (2007). Automatic and controlled processes and the development of addictive behaviors in adolescents: A review and model. *Pharmacology, Biochemistry and Behavior*, 86, 263-283.
- Wiers, R. W., Van Woerden, N., Smulders, F. T. Y., & De Jong, P. J. (2002). Implicit and explicit alcohol-related cognitions in heavy and light drinkers. *Journal of Abnormal Psychology*, 111(4), 648-658.
- Wilson, G. B., Heather, N., & Kaner, E. F. S. (2011). New Developments in Brief Interventions to Treat Problem Drinking in Nonspecialty Health Care Settings. *Current Psychiatry Reports*, 13(5), 422–429.
- Windle, M. (2004). Suicidal behaviors and alcohol use among adolescents: a developmental psychopathology perspective. *Alcohol Clinical and Experimental Research*, 28, 29–37.
- Wojnar, M., & Jakubczyk, A. (2014). Brief interventions for hazardous and harmful alcohol consumption in accident and emergency departments. *Frontiers in Psychiatry*, 5, 152.
- World Health Organization (2011). *ICD-10: International statistical classification of diseases and related health problems (10th Rev. ed.)*. Geneva: World Health Organization.
- World Health Organization (2015). *Global Standards for Quality Health-Care Services for Adolescents. Vol. 1: Standards and criteria*. Retrieved from http://apps.who.int/iris/bitstream/10665/183935/1/9789241549332_vol1_eng.pdf?ua=1.
- Wurdak, M., & Wolstein, J. (2012). *Motivbasierte Intervention am Krankenbett im Rahmen des Projektes 'HaLT – Hart am Limit'*. Abschlussbericht an das Bundesministerium für Gesundheit, 2012. Retrieved from

<http://www.drogenbeauftragte.de/fileadmin/dateien-dba/DrogenundSucht/Alkohol/Downloads/AbschlussberichtMotivbasierteInterventionFin.pdf>.

Wurdak, M., Wolstein, J., & Kuntsche, E. (2016). Effectiveness of a drinking-motive-tailored emergency-room intervention among adolescents admitted to hospital due to acute alcohol intoxication — A randomized controlled trial. *Preventive Medicine Reports*, 3, 83–89.

Yuma-Guerrero, P. J., Velasquez, M. M., von Sternberg, K., Maxson, T., & Garcia, N. (2012). Screening, brief intervention, and referral for alcohol use in adolescents: a systematic review. *Pediatrics*, 130(1), 115–122.

APPENDIX I

Full-texts of publications for the dissertation.

Note: Due to copyright issues publication no III is published in a shortened version (pages 1 – 20 only) in the published version of this dissertation.

Publication I. Brief motivational intervention for adolescents treated for acute alcohol intoxication in the emergency department – a randomized controlled trial (Study protocol)

Reference. Diestelkamp, S., Arnaud, N., Sack, P.-M., Wartberg, L., Daubmann, A., & Thomasius, R. (2014). Brief Motivational Intervention for Adolescents Treated for Acute Alcohol Intoxication in the Emergency Department – a Randomized-Controlled Trial. *BMC Emergency Medicine*, 14:13.

Format: published article

STUDY PROTOCOL

Open Access

Brief motivational intervention for adolescents treated in emergency departments for acute alcohol intoxication – a randomized-controlled trial

Silke Diestelkamp^{1*}, Nicolas Arnaud¹, Peter-Michael Sack¹, Lutz Wartberg¹, Anne Daubmann² and Rainer Thomasius¹

Abstract

Background: Alcohol misuse among youth is a major public health concern and numbers of adolescents admitted to the emergency department for acute alcoholic intoxication in Germany are recently growing. The emergency setting offers an opportunity to reach at-risk alcohol consuming adolescents and provide brief interventions in a potential “teachable moment”. However, studies on brief interventions targeting adolescents in emergency care are scarce and little is known about their effectiveness when delivered immediately following hospitalization for acute alcohol intoxication. In this protocol we present the *HaLT-Hamburg* trial evaluating a brief motivational intervention for adolescents treated in the emergency department after an episode of acute alcoholic intoxication.

Methods: The trial design is a parallel two-arm cluster randomized-controlled trial with follow-up assessment after 3 and 6 months. N = 312 participants aged 17 years and younger will be recruited Fridays to Sundays in 6 pediatric clinics over a period of 30 months. Intervention condition is a manual-based brief motivational intervention with a telephone booster after 6 weeks and a manual-guided intervention for caregivers which will be compared to treatment as usual. Primary outcomes are reduction in binge drinking episodes, quantity of alcohol use on a typical drinking day and alcohol-related problems. Secondary outcome is further treatment seeking. Linear mixed models adjusted for baseline differences will be conducted according to intention-to-treat (ITT) and completers (per-protocol) principles to examine intervention effects. We also examine quantitative and qualitative process data on feasibility, intervention delivery, implementation and receipt from intervention providers, receivers and regular emergency department staff.

Discussion: The study has a number of strengths. First, a rigorous evaluation of *HaLT-Hamburg* is timely because variations of the *HaLT* project are widely used in Germany. Second, prior research has not targeted adolescents in the presumed teachable moment following acute alcohol intoxication. Third, we included a comprehensive process evaluation to raise external validity. Fourth, the study involved important stakeholders from the start to set up organizational structures for implementation and maintaining project impact.

Trial registration: Current Controlled Trials ISRCTN31234060 (April 30th 2012).

Keywords: Emergency department, Adolescents, Brief intervention, Alcohol intoxication, Randomized-controlled trial

* Correspondence: s.diestelkamp@uke.de

¹German Center for Addiction Research in Childhood and Adolescence, University Medical Center Hamburg-Eppendorf, Hamburg, Germany
Full list of author information is available at the end of the article

Background

Alcohol misuse and particularly episodic heavy drinking is a significant public health concern across contemporary societies [1]. In 2011, 47% of European students aged 15 to 16 years experienced alcohol intoxication at least once in their lifetime and 17% did so during the last month [2]. In Germany, the number of adolescents admitted to in-patient treatment for acute alcoholic intoxication (AAI) is recently growing. During the last years the number has more than doubled to over 26.000 in 2011 [3], with high rates of repeated episodes of alcohol intoxication if not treated adequately [4].

Personal health risks associated with AAI for adolescents have been widely documented, including aggressive [5,6] and risky sexual behavior [7] and elevated mortality rates through injury [8] and traffic accidents [9]. Moreover, heavy episodic drinking in adolescence is associated with a number of social and developmental problems, such as deleterious effects on neurocognitive and hormonal development [10-12] and cognitive and emotional abilities [13-15]. Social conflicts, delinquency and problems of academic adjustment are often associated with repeated episodes of heavy drinking [16,17] also puts youth at risk for chronification of problematic substance use patterns into adulthood [18,19]. Beyond these immense personal risks, alcohol-related problems also impose significant economic burdens on public health care [20]. Thus, excessive alcohol use in adolescents continues to be a major public health problem [21,22] and indicated preventive interventions as early as in adolescence are essential [23,24].

Current evidence for brief alcohol interventions

To date, brief interventions (BI's) are among the most empirically supported individual level interventions for reducing alcohol use and alcohol-related problems in adolescents [25,26]. They are often based on principles of Motivational Interviewing (MI) [27], which is characterized by an empathic approach to the client and a non-judgemental and non-confrontative counseling style [28]. Such short-term preventive or therapeutic interventions usually span one to three sessions [29,30] with the goal to establish and support intrinsic motivation for behavior change and/or further treatment seeking [31]. A comprehensive body of evidence documents the usefulness of BI's for problematic alcohol use in primary care [32] and general hospitals [29]. The emergency department (ED) has been identified as a feasible setting to implement early interventions for problematic alcohol use [33,34] and efficacy of BI's in ED has attracted a substantial body of research [35-37]. However, with few exceptions [4,38-41] to date adolescents have been only sparsely addressed [42,43]. None the less a small number of studies indicate feasibility and effectiveness of

BI's for adolescents in an ED following an *alcohol-related event* such as alcohol-induced injury [38-40]. While these studies vary substantially in key conceptual and methodological issues and the heterogeneity of findings limits generalization [Diestelkamp SD, Drechsel M, Arnaud N, Thomasius R: *Brief Interventions for Alcohol-involved Adolescents in Emergency Care: A Systematic Review*, forthcoming] [43], these studies are informative because they support the notion that alcohol-related events causing hospitalization are associated with a "teachable moment" that opens a window of opportunity for effective intervention [44-46]. The experience of a potentially life-threatening AAI resulting in hospitalization supposedly leaves adolescents in a state of increased responsiveness to alcohol-related counseling [46,47]. While awareness of alcohol having prompted ED hospitalization generally influences BI outcomes [45], there is currently a lack of studies addressing the potentials of BI's following AAI hospitalization. Given the articulated need for indicated preventive interventions for AAI we build on the current empirical and conceptual base for BI's in this context as well as our own favourable pilot results for feasibility and initial effectiveness in this context [4]. In this study protocol we present the design and current implementation of a randomized-controlled trial that aims at evaluating effectiveness of a manualized brief motivational intervention (BMI) (indicated intervention) for children and adolescents who are being treated in the ED immediately following AAI, an approach that has been established in Germany and other European countries [48-50] over the last 10 years (see below) but has not been rigorously tested to date. Moreover, we include additional evaluative components to address practical conditions within the "real-world" ED-setting that might affect effectiveness and implementation [51,52].

HaLT-Hart am Limit ("Stop – close to the limit")

HaLT [53] is a German alcohol prevention project that involves a broad network of cooperating institutions to pursue the goal of early prevention of heavy alcohol use among children and adolescents [54]. It is one of the most broadly applied alcohol-specific prevention projects for under 18 year-olds and is currently implemented in more than 160 locations across Germany. It was initiated against the background of growing numbers of children and adolescents in need of emergency medical care following an episode of AAI and growing evidence that adolescents with at-risk alcohol consumption can best be reached in the ED setting [55]. *HaLT* involves two strategies. First, a *proactive* or structural prevention component which aims at promoting responsible alcohol use through outreach work in schools, informing festival organizers and pub owners about risks of underage drinking and providing support for correct implementation of alcohol-specific

regulations for the protection of minors. Second, a behavior-oriented or *reactive* component which includes an individual level “bridging session” targeting children and adolescents in the ED following an AAI and a brief consultation for their caregivers. The reactive component is topic to the study presented in this protocol. The “bridging session” is a single-session, semi-structured indicated preventive intervention based on core principles of MI and implemented by trained facilitators before discharge from hospital. Facilitators provide information on risks associated with excessive drinking and strategies for reducing these risks while highlighting personal responsibility for behavior change. They aim at raising awareness for consequences of risky alcohol consumption and establishing a positive relationship in order to motivate adolescents to take part in an experience-oriented group-training (*risk-check*) for risk-related competences which is offered by a cooperating counseling agency as part of the *HaLT* project (not further addressed in this protocol). Parents or caregivers are also addressed in hospital in order to enhance their motivation to support their child in participating in the group-training. To date, *HaLT* services have been partly evaluated but not using rigorous evaluation methods (RCT). Moreover, existing results [54,56-58] are difficult to generalize because in the field *HaLT* is practically implemented in a broad spectrum of modulations and lacks standardized procedures in intervention content and delivery. The *HaLT-Hamburg* intervention, which is subject of the trial presented in this protocol, includes a number of further developments when compared with *HaLT*. First, a theory-based manualized BMI including a counseling session with caregivers. Second, a manualized training for facilitators in delivering the *HaLT-Hamburg* BMI. Third, definition of standards regarding qualification of facilitators. Fourth, regular clinical group supervision for facilitators and fifth, a pragmatic manual adherence monitoring. Internationally, to our knowledge we are the first to evaluate effectiveness of a BMI for adolescents admitted for AAI in the ED using a randomized-controlled design.

Objectives and hypotheses

The objective of this study is to evaluate the effectiveness of a manual-based BMI for adolescents admitted for AAI in the ED. Effectiveness will be evaluated by expected reductions of binge-drinking frequency (5 or more standard drinks at one occasion (4 for female) [59]), quantity of alcohol consumption on a typical drinking day and alcohol related problems at 3 and 6 month follow-up. Our primary hypothesis is that children and adolescents under the age of 18 years who receive the manualized BMI following AAI hospitalization will show lower levels on these outcomes when compared to controls not receiving this treatment. We also include further health care utilization in response

to the BMI as secondary outcome. Help seeking in the care system as recommended in our BMI is closely related to intention to change [60] and appropriate for additionally judging intervention effectiveness. We thus hypothesize that children and adolescents who receive the BMI will significantly more often access further counseling regarding alcohol use in the 6 months following hospitalization than children and adolescents who do not receive the BMI. Moreover, we will examine a number of expected moderating variables such as psychopathological symptoms, drinking history, concurrent substance use and family environment. Finally, alongside our RCT we include additional evaluation components that focus on process, context and practical implications for BMI delivery under “routine conditions” in the ED setting.

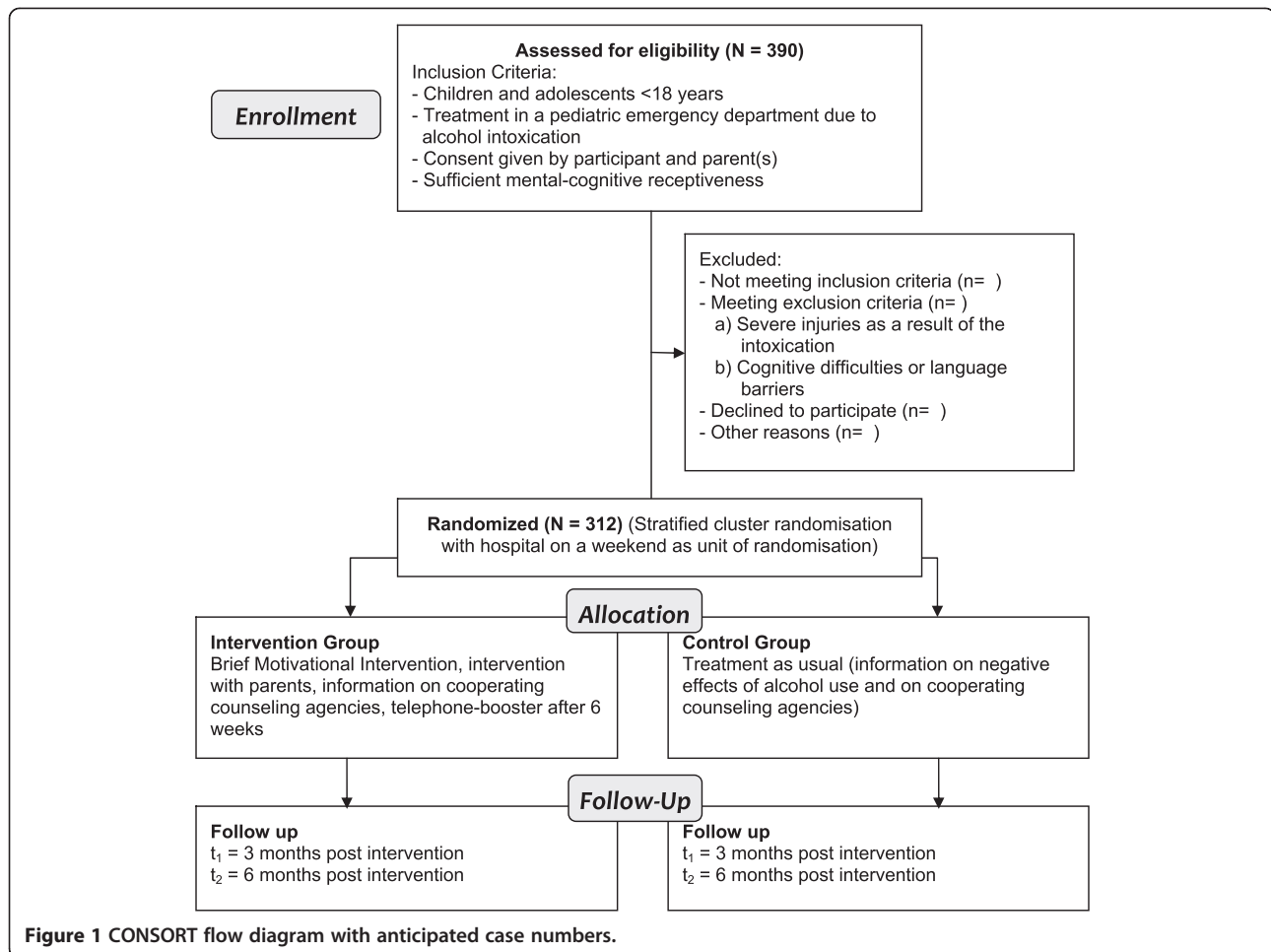
Methods

Trial design, setting and time frame

The *HaLT-Hamburg* study is a parallel two-arm (intervention and control) stratified cluster RCT with follow-up assessments at 3 and 6 months post intervention with hospital on a weekend as unit of randomization and weekend as stratum. All participants receive standard inpatient ED care for AAI. Participants in the intervention group additionally receive a single session manualized BMI before ED discharge with one telephone booster session 6 weeks after the BMI. Caregivers of adolescents in the intervention group also receive a short manual-guided intervention by the same facilitator that delivered the BMI to the adolescent. Participants in the control group receive treatment as usual (TAU) only which is written information on negative consequences of alcohol use in adolescence and information on youth specific substance use counseling agencies. Recruitment of hospitals started in February 2011. Participant data collection started in July 2011 and lasts 30 months with final follow-up assessments being planned for July 2014. Figure 1 displays the CONSORT flow diagram of the study design.

Participating hospitals

ED directors of six pediatric hospitals identified as main treatment providers for alcohol-intoxicated adolescents under the age of 18 [61] in the City of Hamburg, Germany, were invited to a network conference at project launch, informed about the aims and procedures of the project and asked to participate. The conference was hosted by the Hamburg authorities for Health and Consumer Safety (BGV) who cooperates closely in project implementation. It was made clear that BMI's will be delivered by external trained facilitators funded by health insurers since high workload and limited resources by ED staff are widely perceived as barriers for implementation in this context [34]. All six clinics spanning the area of the city agreed to participate in the study. In order to reach as



many eligibles as possible the BGV issued an instruction for the Hamburg rescue coordination center to transfer adolescents with AAI to the six participating ED's.

Participants

Eligibility

Study participants are children and adolescents admitted for AAI (diagnosis F10.0; ICD 10; [62]) in one of the participating clinics and their caregivers. They are eligible for participation if they fulfill the following inclusion criteria: 1. at hospitalization they are under the age of 18 years, 2. at time of data collection and intervention delivery they have sufficiently recovered from AAI and show sufficient mental-cognitive receptiveness, 3. they are fluent in German, 4. informed consent is given by participant and parent(s)/caregiver(s), 5. absence of severe injuries. We have purposefully limited exclusion criteria and designed inclusion/exclusion criteria for study participation to reflect actual clinical conditions. In principle, all individuals that would receive the BMI under "real" clinical conditions are eligible to participate in the study. This way we aim at maximizing external validity

of our study findings. The age limit reflects the age range addressed in the German-wide *HaLT* project.

Recruitment and procedure

Given that previous studies indicate that in Germany most AAI's in youth happen at Friday and Saturday night [61], and an everyday stand-by recruitment was not possible due to limited resources, we recruit participants in the participating clinics on Friday, Saturday and Sunday mornings (between 7 – 9 am). Recruitment and data collection is carried out by trained research assistants and intervention delivery by trained facilitators who form a mobile intervention team. Coordination of attendance and resource availability is managed by a detailed operation schedule for each weekend. At each weekend in the evaluation period, research assistants contact all participating hospitals and ask about under 18 year-olds admitted to ED following AAI. If this is the case and if the patient has not been discharged in the same night, a research assistant visits the patient in hospital, informs about the project (evaluation and intervention), confidentiality, voluntariness of participation and right to withdraw consent and

obtains active informed consent to participate in the study from patients and caregivers. Patients in the intervention and the control group are informed that they are compensated with incentives (shopping vouchers) summing up to €60 for complete data collection (€10 for baseline assessment and €25 for each completed follow-up assessment). If eligible patients and their caregivers who are willing to give consent are hospitalized in a clinic that was randomly assigned to form the intervention group for this weekend, the research assistant contacts one of the facilitators to deliver the BMI. Adolescents in the intervention group are contacted by telephone 6 weeks after hospitalization for a 5–10 minute manualized booster session to enhance motivation to pursue alcohol-related goals as set in hospital. All study participants are assessed via telephone for follow-up at 3 and 6 months post intervention. Approval for the study was obtained from the ethics committee of the Chamber of Psychotherapists Hamburg (Germany) prior to data collection. The study is conducted in accordance with CONSORT guidelines (Additional file 1) and is registered under Current Controlled Trials ISRCTN31234060 (<http://www.controlled-trials.com/ISRCTN31234060>).

BMI condition

HaLT-Hamburg brief intervention

The BMI is based on the German prevention program “*HaLT-Hart am Limit*” (“*Stop – close to the limit*”) and was adapted in a participatory process with cooperating practice partners, a youth-specific substance use counseling agency and an outpatient clinic for adolescents and young adults with substance use disorders. It is based on MI [28] and components reflect BMI elements as put forward by Spirito et al. [38]. The intervention is manual-based and consists of one 45-minute session. It's 5 components are: 1. Introduction to the session with positive feedback on patient's willingness to engage in the intervention, expression of interest and concern transporting a positive and empathic therapeutic mindset and explanation of the intervention's aim and content. 2. A semi-structured interview assessing circumstances of the intoxication and alcohol-related risk behaviors. 3. Exploration phase incorporating discussion of motivation to drink, normative feedback, exploring pros and cons of current alcohol use, optional use of MI tools (i.e., importance and confidence ruler, decisional balance sheet) and establishment of future scenarios with changed/unchanged alcohol use. 4. Summary in which the facilitator structures and sums up what has been discussed, highlights personal responsibility for change and asks the patient for his/her conclusion from what has been discussed so far. 5. Closure of the session beginning with identification of drinking goals and potential barriers and development of strategies for goal attainment. The session is finished with a written

agreement on drinking goals, the introduction of the cooperating youth-specific counseling agency and promotion of patient's self-efficacy.

Counseling session for caregivers

Parents maintain significant influence on adolescent's alcohol use and parental integration has been proposed to greatly enhance efficacy of targeted prevention programs [63]. When caregivers pick up the adolescent in hospital they can easily be reached and are offered a brief consultation by the same facilitator who delivered the BMI to the adolescent. Caregivers are encouraged to reflect on the AAI episode of the minor and develop strategies to prevent future risky alcohol use. They are provided with general information on alcohol and alcohol-related risks and are encouraged to seek further family- and/or substance use related services if required. Afterwards parents, facilitator and adolescent get together for a summary statement that focuses on supporting the adolescent's sense of self-efficacy with regards to the attainment of his/her alcohol-related goals.

Telephone booster

Adolescents are contacted by telephone 6 weeks after discharge from hospital. The booster session is structured (manual-guided), lasts about 5–10 minutes and aims at enhancing content of the BMI and increasing motivation to pursue alcohol-related goals as set in hospital.

Control condition

Participants in the control group are approached by a research assistant. After informed consent is given, they receive TAU which presently consists of oral and written information on cooperating youth- and family-orientated counseling agencies combined with the recommendation to contact a counseling agency and a flash drive with information on negative consequences of alcohol misuse for children and adolescents. Personal contact for TAU has a duration of 5–10 minutes.

Treatment fidelity

Generally, the intervention is designed in a standardized way, yet it leaves facilitators with a certain leeway. This mentality reflects practitioners needs for flexibility and empathic focus on the client's concerns in a MI spirit while keeping structure and content of the intervention sufficiently standardized [64]. Treatment fidelity is maintained using several strategies. First, the intervention (as the counseling session with parents/caregivers) is manualized. It provides clear guidelines and steps to be followed when carrying through the BI. Guidance is further enhanced by a short “memo-card”, which includes cues for core elements of the introduction, interview, exploration, summary and closure to the session and a

reminder of the optional use of MI-tools. Additionally we developed a guide for delivering the telephone-booster. Second, all facilitators have a masters degree in psychology, social education work or related fields and are experienced in working with minors and their parents. Third, facilitators are initially trained by experienced and certified trainers (a clinical psychologist, a social educational worker and a research psychologist) in MI skills and in delivering the manualized BMI (12 hrs of training). On a bi-monthly basis facilitators are clinically supervised to discuss problems and experiences of implementation, engage in role-plays and receive retraining if required. Moreover, the manual was developed in a participatory approach by a team of experienced professionals including social education workers and senior clinical psychologists to raise practitioners acceptance and secure practicability under clinical conditions.

Measures

Primary outcomes of the trial are reductions of past-month binge-drinking frequency, past-month quantity of alcohol consumption on a typical drinking day and alcohol-related problems in the past 3 months. We define binge drinking as consumption of 5 (4 for girls) or more alcoholic drinks at one occasion [59] and consider it as adequate primary outcome because it increases the risk for and often precedes AAI [4]. To assess binge drinking frequency we use a single question that is adapted from the Alcohol Use Disorder Identification Test Consumption subscale (AUDIT-C) [65] as used in a previous study [66]. Additional primary drinking outcome will be quantity of alcohol consumed on a typical drinking day as another indicator of risk for repeated AAI. For both alcohol measures (binge drinking and quantity of alcohol intake on a typical drinking day), we consider one unit of alcohol (standard drink) to include 10 g ethanol and we use a graphical overview of various types of drinks to help respondents answer the question and to ensure standardized responses. To assess alcohol-related behavioral problems we use the Rutgers Alcohol Problems Index (RAPI) [67] which is widely used and valid for an adolescent target population [68-71]. The secondary outcome concerns further seeking of counseling for alcohol use, which is retrospectively assessed by a single dichotomous (yes/no) question at both follow-ups and details on access and duration of services used.

Additionally we assess concurrent substance use following the assessment standards III of the German Society for Addiction Research and Therapy [72], repeated hospitalization due to AAI, general psychopathology through a short version of the Symptom Checklist SCL-9-K [73] and the Screening of Psychological Disorders in Adolescence (SPS-J) [74] as a behavioral screening instrument for early detection of externalizing and

internalizing problems. Furthermore we assess readiness to change through an algorithm [75] allowing allocation of individuals to the different stages of change as proposed by Prochaska and DiClemente [76] and alcohol-related cognitive variables such as knowledge (modified from [77]), social norms [77], self-efficacy (selected items of the Alcohol Abstinence Self Efficacy Scale (AASE-G) [78]) and attitudes through a 9-item semantic differential [79]. All assessment instruments are based on self-reports. We collect basic demographic data on age, gender, ethnic- and socioeconomic family status.

Additional components of evaluation

As mentioned above we include additional components to evaluate effectiveness alongside our RCT design. In summary, we examine quantitative and qualitative process data on intervention delivery, implementation and receipt from intervention providers, receivers and regular ED staff which is guided by the framework of RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) as suggested by Glasgow and colleagues [80]. This framework represents a systematic approach to the evaluation of research translation potentials into practice and has been applied for the evaluation of implementation of BI's in ED before [34].

Intervention implementation and delivery

We will explore qualitative contextual information about AAI treatment in the participating clinics and whether the *HaLT-Hamburg* intervention is familiar to the clinic staff. Furthermore we examine attitudes, level of interest/commitment and perceived barriers for routine implementation among ED staff (medicals, nurses) and BMI facilitators. This information includes structural conditions affecting delivery (e.g., is the BMI delivered in a separate room or a corridor with hospital staff, patients and visitors passing by) as well as duration of session and type and duration of possible interruptions. Facilitators complete a short record indicating details about intervention delivery (such as content, MI-techniques used, referral to further counseling) after each BI. Finally, heads of departments will be interrogated providing information on perceived barriers and resources for long term project implementation.

Receipt and acceptance of BMI

Patient's acceptance of the intervention is evaluated with the Treatment Satisfaction Questionnaire (Fragebogen zur Patientenzufriedenheit ZUF-8, [81]) using 8 items (e.g. "To what extent did the counselling session meet your needs?"). For adherence to MI spirit patients rate their perception of facilitator's therapeutic skills with 8 items (e.g. "the facilitator respects me", "the facilitator seems empathic") on a 4-point response scale immediately

after the BI session in hospital (Index of Basic Therapeutic Skills (BIS) (short version) [82]).

Feasibility

Similar to the approach of Linakis et al. [23] we assess feasibility through the number of enrolled participants and the number of those who complete all elements of the intervention. An indication for feasibility will be given if at least 80% eligibles participate and 90% or more of those who participate complete the intervention before discharge from hospital.

Randomization

Because of limited resource availability, individual level random assignment of eligible participants to BMI or control condition is not feasible in this study. Instead a stratified cluster randomization is deemed appropriate with weekends ($N = 129$) as stratum and hospital ($N = 6$) on a weekend as unit of randomization. Over a data collection period of 30 months this yields a total of $N = 774$ possible clusters. This approach leads to a high number of clusters, which is highly recommended [83] and assures that at each weekend patients in one half of the hospitals are assigned to the BMI and the other half to the control condition. The total amount of possible combinations between strata and hospitals is balanced in a way that each clinic acts equally often as control and BMI condition and assures that all clinics are either control or BMI condition at each weekend. The resulting randomization plan was established prior to the data collection process by a research assistant from the Department of Medical Biometry and Epidemiology (University Hospital Hamburg-Eppendorf) who is not involved in the project, using the statistical software package SAS, Version 9.3 [84].

Sample size

The sample size is calculated for the three primary outcomes binge-drinking frequency, quantity of alcohol consumption on a typical drinking day and alcohol related problems at 3 month follow-up. Type I error is set to 5% for each of these outcomes. With an effect size of 0.26 and a power of 80%, 2×153 patients need to be included if randomization occurs at patient level. With an assumed intra-cluster correlation of 0.05 and an average of 1.264 included patients per cluster, we calculated a design effect of 1.013. Hence, the required sample size increases to 156 patients and 154 clusters per group, resulting in a total sample of $N = 312$. Clusters (hospitals per weekend) without patients will not be included in the analysis. With an expected participation rate of 80%, we anticipate $N = 390$ ED patients to be assessed for eligibility over a recruitment period of 30 months in the six participating hospitals. Based on a prior pilot-study [4], this sample size is feasible.

Statistical analysis

Basic descriptive statistics will be calculated for baseline variables, and according to trial arm (BMI vs. control). Intention-to-treat (ITT) analysis will be based on available data from all randomized patients at 3 and 6 month follow-up. In case of missing follow-up values multiple imputation will be performed [85]. For primary and secondary hypotheses we will use linear mixed models adjusted for baseline differences to examine differences between intervention and control group with intervention condition as fixed effect and clusters (hospital on a weekend) as random effect. The two-sided α -level is set to 0.05. Additional analysis will be conducted on a per-protocol analysis set. Process data on intervention delivery, implementation and receipt will be analyzed in subsequent steps.

Discussion

In this study protocol we present the design and current implementation of a randomized-controlled trial which aims at evaluating the effectiveness of the indicated *HaLT-Hamburg* intervention for children and adolescents following treatment due to AAI in the ED. Beside a rigorous trial design with focus on relevant alcohol-related outcomes, we include additional evaluative components to address important issues of feasibility and practical implementation under “real-world” conditions in an ED-setting.

Strengths and limitations

The study has a number of significant strengths. First and foremost, a rigorous evaluation of this intervention is timely because *HaLT* interventions are already widely applied in Germany in different modulations. *HaLT* interventions are brief and based on MI, which has been proven effective for reducing alcohol-related problems [64,86]. Previous study results are promising [54,56-58], yet difficult to generalize and full scale trial evaluations including process and implementation evaluation are missing to date. Overall, with our study we contribute to the literature mainly because studies addressing effectiveness of BI's in the ED with a focus on minors hospitalized following an alcohol-related event are scarce [Diestelkamp SD, Drechsel M, Arnaud N, Thomasius R: *Brief Interventions for Alcohol-involved Adolescents in Emergency Care: A Systematic Review*, forthcoming] and most existing RCT's in the ED setting have been conducted in the U.S., leaving uncertainty whether results generalize to other countries [87]. To our knowledge we are the first to target adolescents in the ED immediately after the experience of an AAI. This approach appears promising due to a presumed “teachable moment” arising from the potentially life-threatening experience of AAI leading to hospitalization. This experience provides a window of opportunity for initiating behavior change in minors who have elevated risks for repeated AAI episodes

if untreated [4] and who are in a developmental stage in which risk behaviors are normative which may limit responsiveness to MI or brief advice in other settings [88].

Another strength is the integration of additional evaluative components via a comprehensive process evaluation which qualifies *HaLT-Hamburg* as a pragmatic trial [89,90] and raises external validity. In the considerations guiding our study we aimed at minimally interfering with “real world” conditions, as indicated by applying rather unrestricted inclusion (access-to-care) criteria, unobtrusive measures for intervention fidelity monitoring, employing facilitators who will continue working in the project after data collection has ceased (as opposed to research assistants) and a number of other aspects associated with implementation and intervention delivery. For example, while intervention, telephone booster and training sessions are manual-based and replicable, facilitators are left with a certain leeway in intervention delivery to allow tailoring of the intervention to the patient’s needs in order to adhere to MI spirit [64]. This may pose a limiting factor for internal validity. However, we included measures for manual adherence and MI-fidelity as well as clients’ ratings of perceived facilitator’s MI skills. A second possible limiting factor is that our data are based on self-reports. However, this approach is widely used in comparable studies [24] and previous studies indicate that adolescent self-reports on substance use are reasonably valid [91,92].

Implications for practice

As mentioned above, our study addresses a number of practical aspects. Importantly, actions for setting up organizational structures to implementation involving relevant stakeholders have been considered from the beginning of the project. This way, funding of ED external trained facilitators could be assured by partnering health insurances during the study period and with a clear perspective of further funding if our intervention proves effective. Moreover, our study is embedded in *psychnet: the Hamburg Network for Mental Health* [93] with over 60 partners from research, health care, health industry and government in the Free and Hanseatic City of Hamburg. This network provides a strong structural resource for further implementation. *HaLT-Hamburg* is thus well embedded and supported by communal structures, is implemented under “real world” clinical conditions and is therefore suited to reveal important information on possible barriers and resources for practical implementation [60,94] in addition to insights on effectiveness and conditions influencing effectiveness of the *HaLT-Hamburg* BMI.

Conclusion

Our study addresses a highly relevant target group and contributes to the current literature on brief interventions by filling apparent gaps. The study will provide insights

about effectiveness of the *HaLT-Hamburg* intervention and hence about a promising approach of targeted interventions for adolescents experiencing AAI. Moreover, we integrated the evaluation of practical implications and address important elements of translational research as well as actions needed to sustainably implement BI’s under practical conditions, an issue often neglected in prior research.

Additional file

Additional file 1: CONSORT checklist.

Abbreviations

AAI: Acute alcohol intoxication; BI: Brief intervention; BMI: Brief motivational intervention; ED: Emergency department; MI: Motivational interviewing; TAU: Treatment as usual.

Competing interests

The authors declare that they have no competing interests.

Authors’ contributions

SD and NA drafted the manuscript. PMS and RT obtained funding. SD, PMS and RT designed the intervention and developed the study methodology in close cooperation with AD. AD calculated the sample size and established the randomization plan. SD developed the training and intervention manual. NA and RT coordinate the study. LW and SD are responsible for carrying through its organizational processes. All authors read and approved the final manuscript.

Acknowledgements

The trial officially named *Health network “alcohol abuse in adolescence: Improved access-to-care for children and adolescents with at-risk alcohol use”* is a sub-project of *psychnet – the Hamburg Network for Mental Health* [93] and is implemented in cooperation with the Office of Health and Consumer Safety in the Free and Hanseatic City of Hamburg (BGV) and the youth-specific substance use counseling agency K616a. The research and development project *psychnet* (2011–2014) is funded by the German Federal Ministry of Education and Research (BMBF) (Ref: 01KQ1002B) and aims at strengthening health care regions in Germany by establishing new transsectoral cooperations and implement and evaluate selected innovations. Further information and a list of all project partners can be found at <http://www.psychnet.de>. The funding source had no role in the design of this study and will not have any role during its execution, analyses, interpretation of the data, or decision to submit results. We thank Udo Kuestner and Katrin Lammers for substantial contributions to intervention manual development and for facilitator’s training development and realization, Prof. K. Wegscheider for his highly valued methodological advice and our research assistants for their high commitment.

Author details

¹German Center for Addiction Research in Childhood and Adolescence, University Medical Center Hamburg-Eppendorf, Hamburg, Germany.

²Department of Medical Biometry and Epidemiology, University Medical Center Hamburg-Eppendorf, Hamburg, Germany.

Received: 13 April 2014 Accepted: 18 June 2014

Published: 30 June 2014

References

1. Conrod PJ, Castellanos-Ryan N, Mackie C: **Long-term effects of a personality-targeted intervention to reduce alcohol use in adolescents.** *J Consult Clin Psychol* 2011, **79**(3):296–306.
2. Hibell B, Guttormsson U, Ahlström S, Balakireva O, Bjarnason T, Kokkevi A, Kraus L: *The 2011 ESPAD report: Substance use among students in 36 European countries.* Stockholm: The Swedish council for information on alcohol and other drugs (CAN); 2012.
3. Gesundheitsberichterstattung des Bundes: **Diagnosedaten der Krankenhäuser ab 2000.** [<http://www.gbe-bund.de>]

4. Stolle M, Sack P-M, Broening S, Baldus C, Thomasius R: **Brief Intervention in Alcohol Intoxicated Adolescent-A follow-up study in an access-to-care sample.** *J Alcohol Drug Depend* 2013, **1**:106.
5. Swahn MH, Simon TR, Hammig BJ, Guerrero JL: **Alcohol consumption behaviors and risk for physical fighting and injuries among adolescent drinkers.** *Addict Behav* 2004, **29**(5):959-963.
6. MacDonald S, Cherpitel CJ, Borges G, DeSouza A, Giesbrecht N, Stockwell T: **The criteria for causation of alcohol in violent injuries based on emergency room data from six countries.** *Addict Behav* 2005, **30**(1):103-113.
7. Champion HLO, Foley KL, DuRant RH, Hensberry R, Altman D, Wolfson M: **Adolescent sexual victimization, use of alcohol and other substances, and other health risk behaviors.** *J Adolesc Health* 2004, **35**(4):321-328.
8. Sindelar HA, Barnett NP, Spirito A: **Adolescent alcohol use and injury: A summary and critical review of the literature.** *Minerva Pediatr* 2004, **56**(3):291-309.
9. Viner RM, Taylor B: **Adult outcomes of binge drinking in adolescence: findings from a UK national birth cohort.** *J Epidemiol Community Health* 2007, **61**(10):902-907.
10. Townshend JM, Duka T: **Binge Drinking, Cognitive Performance and Mood in a Population of Young Social Drinkers.** *Alcohol Clin Exp Res* 2005, **29**(3):317-325.
11. Heffernan T, Clark R, Bartholomew J, Ling J, Stephens S: **Does Binge Drinking in Teenagers affect their Everyday Prospective Memory?** *Drug Alcohol Depend* 2010, **109**:73-78.
12. McQueeney T, Schweinsburg BC, Schweinsburg AD, Jacobus J, Baya S, Frank LR, Tapert SF: **Altered White Matter Integrity in Adolescent Binge Drinkers.** *Alcohol Clin Exp Res* 2009, **33**(7):1278-1285.
13. Spear L: **Adolescent brain and the college drinker: biological basis of propensity to use and misuse alcohol.** *J Stud Alcohol* 2002, **14**:71-81.
14. Tapert SF, Granholm E, Leedy NG, Brown SA: **Substance use and withdrawal: neuropsychological functioning over 8 years in youth.** *J Int Neuropsychol Soc* 2002, **8**:873-883.
15. Pharo H, Sim C, Graham M, Gross J, Hayne H: **Risky Business: Executive Function, Personality, and Reckless Behavior During Adolescence and Emerging Adulthood.** *Behav Neurosci* 2011, **125**:970-978.
16. Miller JW, Naimi TS, Brewer RD, Jones SE: **Binge drinking and associated health risk behaviours among high school students.** *Pediatrics* 2007, **119**(1):76-85.
17. Battin-Pearson S, Newcomb MD, Abbott RD, Hill KG, Catalano RF, Hawkins JD: **Predictors of early high school dropout: A test of five theories.** *Br J Educ Psychol* 2000, **92**(3):568-582.
18. Van Der Vorst H, Vermulst AA, Meeus WH, Dekovic M, Engels RC: **Identification and prediction of drinking trajectories in early and mid-adolescence.** *J Clin Child Adolesc Psychol* 2009, **38**(3):329-341.
19. Stolle M, Sack PM, Thomasius R: **Binge Drinking in Childhood and Adolescence Epidemiology, Consequences, and Interventions.** *Dtsch Arztebl Int* 2009, **106**(19):323.
20. Toumbourou JW, Stockwell T, Neighbors C, Marlatt GA, Sturge J, Rehm J: **Interventions to reduce harm associated with adolescent substance use.** *Lancet* 2007, **369**(9570):1391-1401.
21. Dawson DA, Goldstein RB, Chou SP, Ruan WJ, Gran BFT: **Age at First Drink and the First Incidence of Adult-Onset DSM-IV Alcohol Use Disorders.** *Alcohol Clin Exp Res* 2008, **32**(12):2149-2160.
22. Grant BF, Stinson FS, Harford TC: **Age at onset of alcohol use and DSM-IV alcohol abuse and dependence: a 12-year follow-up.** *J Subst Abuse* 2001, **13**(4):493-504.
23. Linakis JG, Bromberg J, Baird J, Nirenberg TD, Chun TH, Mello MJ, Jackson KM, Spirito A: **Feasibility and Acceptability of a Pediatric Emergency Department Alcohol Prevention Intervention for Young Adolescents.** *Pediatr Emerg Care* 2013, **29**(11):1180-1188.
24. Lammers J, Goossens F, Lokman S, Monshouwer K, Lemmers L, Conrod P, Wiers R, Engels R, Kleinjan M: **Evaluating a selective prevention programme for binge drinking among young adolescents: study protocol of a randomized controlled trial.** *BMC Public Health* 2011, **11**:126.
25. Moyer A, Finney JW, Swearingen CE, Vergun P: **Brief interventions for alcohol problems: a meta-analytic review of controlled investigations in treatment-seeking and non-treatment-seeking populations.** *Addiction* 2002, **97**:279-292.
26. Bertholet N, Daepfen JB, Wietlisbach V, Fleming M, Burnand B: **Reduction of alcohol consumption by brief alcohol intervention in primary care: systematic review and meta-analysis.** *Arch Intern Med* 2005, **165**(9):986-995.
27. Walters ST, Neighbors C: **Feedback interventions for college alcohol misuse: What, why and for whom?** *Addict Behav* 2005, **30**:1168-1182.
28. Miller WR, Rollnick S: *Motivational Interviewing: Preparing People for change.* 2nd edition. New York: The Guilford Press; 2002.
29. McQueen J, Howe TE, Allan L, Mains D, Hardy V: **Brief interventions for heavy alcohol users admitted to general hospital wards.** *Cochrane Database Syst Rev* 2011. <http://dx.doi.org/10.1002/14651858>.
30. Babor TF: **Avoiding the horrid and beastly sin of drunkenness: does dissuasion make a difference?** *J Consult Clin Psychol* 1994, **62**(6):1127-1140.
31. Spijkerman R, Roek MAE, Vermulst A, Lemmers L, Huijberts A, Engels RCME: **Effectiveness of a web-based brief alcohol intervention and added value of normative feedback in reducing underage drinking: a randomized controlled trial.** *J Med Internet Res* 2012, **12**(5):e65.
32. Kaner EF, Dickinson HO, Beyer FR, Campbell F, Schlesinger C, Heather N, Saunders JB, Burnand B, Pienaar ED: **Effectiveness of brief alcohol interventions in primary care populations.** *Cochrane Database Syst Rev* 2007. <http://dx.doi.org/10.1002/14651858>.
33. Rumpf HJ: **Early intervention in the medical care of problematic alcohol use: On the way to implementation.** *Sucht* 2009, **55**(6):326-327.
34. Bernstein E, Topp D, Shaw E, Girard C, Pressman K, Woolcock E, Bernstein J: **A Preliminary Report of Knowledge Translation: Lessons From Taking Screening and Brief Intervention Techniques From the Research Setting Into Regional Systems of Care.** *Acad Emerg Med* 2009, **16**(11):1225-1233.
35. Nilsen P, Baird J, Mello MJ, Nirenberg T, Woolard R, Bendtsen P, Longabaugh R: **A systematic review of emergency care brief alcohol interventions for injury patients.** *J Subst Abuse Treat* 2008, **35**:184-201.
36. Havarad A, Shakeshaft A, Sanson-Fisher R: **Systematic review and meta-analyses of strategies targeting alcohol problems in emergency departments: interventions reduce alcohol-related injuries.** *Addiction* 2008, **103**:368-376.
37. D'Onofrio G, Fiellin DA, Pantalon MV, Chawarski MC, Owens PH, Degutis LC, Busch SH, Bernstein SL, O'Connor PG: **A brief intervention reduces hazardous and harmful drinking in emergency department patients.** *Ann Emerg Med* 2012, **60**(2):181-192.
38. Spirito A, Monti PM, Barnett NP, Colby SM, Sindelar H, Rohsenow DJ, Lewander W, Myers M: **A randomized clinical trial of a brief motivational intervention for alcohol-positive adolescents treated in an emergency department.** *J Pediatr* 2004, **145**(3):396-402.
39. Monti PM, Colby SM, Barnett NP, Spirito A, Rohsenow DJ, Myers M, Woolard R, Lewander W: **Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital emergency department.** *J Consult Clin Psychol* 1999, **67**(6):989-994.
40. Monti PM, Barnett NP, Colby SM, Gwaltney CJ, Spirito A, Rohsenow DJ, Woolard R: **Motivational interviewing versus feedback only in emergency care for young adult problem drinking.** *Addiction* 2007, **102**(8):1234-1243.
41. Spirito A, Sindelar-Manning H, Colby SM, Barnett NP, Lewander W, Rohsenow DJ, Monti PM: **Individual and family motivational interventions for alcohol-positive adolescents treated in an emergency department: results of a randomized clinical trial.** *Arch Pediatr Adolesc Med* 2011, **165**(3):269-274.
42. Yuma-Guerrero PJ, Velasquez MM, von Sternberg K, Maxson T, Garcia N: **Screening, brief intervention, and referral for alcohol use in adolescents: a systematic review.** *Pediatrics* 2012, **130**(1):115-122.
43. Newton AS, Gokiert R, Mabood N, Ata N, Dong K, Ali S, Vandermeer B, Tjosvold L, Hartling L, Wild TC: **Brief emergency department interventions for youth who use alcohol and other drugs: a systematic review.** *Pediatr Emerg Care* 2013, **29**(5):673-684.
44. Williams EC, Palfai T, Cheng DM, Samet JH, Bradley KA, Koepsell TD, Wickizer TM, Heagerty PJ, Saitz R: **Physical Health and Drinking Among Medical Inpatients With Unhealthy Alcohol Use: A Prospective Study.** *Alcohol Clin Exp Res* 2010, **34**(7):1257-1265.
45. Walton MA, Goldstein AL, Chermack ST, McCammon RJ, Cunningham R, Barry KL, Blow FC: **Brief alcohol intervention in the emergency department: moderators of effectiveness.** *J Stud Alcohol Drugs* 2008, **69**(4):550-560.
46. Barnett NP, Monti PM, Wood MD: **Motivational interviewing for alcohol-involved adolescents in the emergency room.** In *Innovations in adolescent substance abuse interventions.* Edited by Wagner EF, Waldron HB. Amsterdam: Pergamon/Elsevier Science Inc; 2001:143-168.
47. Roper L, McGuire J, Salmon P, Booth PG: **Treatment-seeking for alcohol problems: The influence of mirroring events and windows of opportunity.** *Addict Res Theory* 2013, **21**:479-488.
48. Lang S, Kuttler H: **Projekt HaLT - Hart am Limit. Fruehintervention und kommunal verankerte Strategie zur Verhinderung von riskantem**

- Rauschtrinken bei Kindern und Jugendlichen [Project Stop - Close to the Limit. Early intervention and community based strategies for the prevention of binge drinking in children and adolescents]. *Sucht* 2007, **30**(1):27–37.
49. Cafisch M, Uldry V: At the crossover of adolescent and alcohol. *Rev Med Suisse* 2013, **9**(374):406–409.
50. Fandler E, Scheer P, Rödl S, Müller W: Alkoholmissbrauch und -abhängigkeit bei Kindern und Jugendlichen [Alcohol misuse and dependence in children and adolescents]. *Monatsschr Kinderheilk* 2008, **156**:591–604.
51. Daepfen JB: A meta-analysis of brief alcohol interventions in emergency departments: Few answers, many questions - Commentary. *Addiction* 2008, **103**(3):377–378.
52. Pantalon MV, Martino S, Dziura J, Li FY, Owens PH, Fiellin DA, O'Connor PG, D'Onofrio G: Development of a scale to measure practitioner adherence to a brief intervention in the emergency department. *J Subst Abuse Treat* 2012, **43**(4):382–388.
53. Kuttler H, Lang S: Halt sagen – Halt geben. Ein Präventionsprojekt für Jugendliche mit riskantem Alkoholkonsum [Say stop and give support: A prevention project for adolescents with risky alcohol drinking behavior]. *Prevention* 2004, **1**:24–26.
54. Prognos: The national pilot project HaLT – scientific monitoring. [http://www.prognos.com/fileadmin/pdf/publikationsdatenbank/HaLT Short Report.pdf]
55. Healey C, Rahmana A, Faizal M, Kinderman P: Underage drinking in the UK: Changing trends, impact and interventions. A rapid evidence synthesis. *Int J Drug Policy* 2014, **25**:124–132.
56. Reis O, Papke M, Haessler F: Ergebnisse eines Projektes zur kombinierten Prävention jugendlichen Rauschtrinkens [Evaluation of a project for the prevention of adolescent binge drinking]. *Sucht* 2009, **55**(6):347–356.
57. Müller S, Pabst A, Kronthalwer F, Grübl A, Kraus L, Burdach S, Tretter F: Akute Alkoholvergiftung bei Jugendlichen – Erste Ergebnisse eines Münchner Pilotprojekts [Acute alcohol intoxication in adolescents: preliminary results of a pilot project in Munich]. *Dtsch Med Wochenschr* 2009, **134**(21):1101–1105.
58. Wurdak M, Wolstein J: Motivbasierte Intervention am Krankenbett im Rahmen des Projektes HaLT –Hart am Abschlussbericht an das Bundesministerium für Gesundheit [Motiv-based intervention in hospital as part of the project "Stop - Close to the Limit". Final report to the Federal Ministry of Health]. [http://www.drogenbeauftragte.de/fileadmin/dateien-dba/DrogenundSucht/Alkohol/Downloads/AbschlussberichtMotivbasierteInterventionFin.pdf]
59. Herring R, Berridge V, Thom B: Binge drinking: an exploration of a confused concept. *J Epidemiol Community Health* 2008, **62**(6):476–479.
60. Kypri K: Methodological Issues in Alcohol Screening and Brief Intervention Research. *Subst Abuse* 2007, **28**(3):31–42.
61. Sack PM, Stolle M, Thomasius R: Erfassung alkoholintoxizierter Kinder und Jugendlicher bis 21 Jahre in Hamburg mittels eines Postkartenmeldesystems (E-AK21). Abschlussbericht an die BGS der Freien und Hansestadt Hamburg [Survey on alcohol intoxicated children and youths up to the age of 21 in Hamburg using a postcard registration system (E-AK21). Final report to the Office of Health of the Free and Hanseatic City of Hamburg]. Hamburg: DZSKJ; 2009.
62. World Health Organization: ICD-10: International statistical classification of diseases and related health problems (10th Rev. ed.). Geneva: World Health Organization; 2011.
63. Abar CC: Examining the relationship between parenting types and patterns of student alcohol-related behavior during the transition to college. *Psychol Addict Behav* 2012, **26**:20–29.
64. Hettema J, Steele J, Miller RW: Motivational interviewing. *Annu Rev Clin Psychol* 2005, **1**:91–111.
65. Saunders JB, Aasland OG, Babor TF, de la Fuente JR, Grant M: Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO Collaborative Project on Early Detection of Persons with Harmful Alcohol Consumption-II. *Addiction* 1993, **88**(6):791–804.
66. Arnaud N, Bröning S, Drechsel M, Thomasius R, Baldus C: Web-based screening and brief intervention for poly-drug use among teenagers: study protocol of a multicentre two-arm randomized controlled trial. *BMC Public Health* 2012, **12**:826.
67. Earleywine M, LaBrie JW, Pedersen ER: A brief Rutgers Alcohol Problem Index with less potential for bias. *Addict Behav* 2008, **33**(9):1249–1253.
68. White HR, Labouvie EW: Towards the assessment of adolescents problem drinking. *J Stud Alcohol* 1989, **50**(1):30–37.
69. van Woerden N, Smulders FTY, de Jong PJ: Implicit and explicit alcohol related cognitions in heavy and light drinkers. *J Abnorm Psychol* 2002, **111**(4):648–658.
70. Wiers RW, van de Luitgaarden J, van den Wildenberg E, Smulders FTY: Challenging implicit and explicit alcohol-related cognitions in young heavy drinkers. *Addiction* 2005, **100**(6):806–819.
71. Wiers RW: Alcohol and drug expectancies as anticipated changes in affect: negative reinforcement is not sedation. *Subst Use Misuse* 2008, **43**(3–4):501–516.
72. Deutsche Gesellschaft für Suchtforschung und Suchttherapie (Hrsg.): Standards für die Durchführung von Katamnesen bei Abhängigen [Standards in conducting catamnesis in people with addictions]. Freiburg im Breisgau: Lambertus; 1985.
73. Klaghofer R, Brähler E: Konstruktion und Teststatistische Prüfung einer Kurzform der SCL-90-R [construction and evaluation of the short version of SCL-90-R]. *Z Klin Psychol Psychiatr Psychother* 2001, **49**(2):115–124.
74. Hampel P, Petermann F: SPS-J - Screening psychischer Störungen im Jugendalter. Deutschsprachige Adaptation des Reynolds Adolescent Adjustment Screening InventoryTM (RAASITM) von William M. Reynolds [SPS-J - Screening of psychological disorders in adolescence. German adaptation of the Reynolds Adolescent Adjustment Screening InventoryTM (RAASITM) by William M. Reynolds]. Goettingen: Hogrefe; 2005.
75. Heidenreich T, Hoyer J: Stadien der Veränderung bei Substanzmissbrauch und -abhängigkeit: Eine methodenkritische Übersicht [Stages of change in addictive behaviors: A methodological overview]. *Sucht* 2001, **47**(3):158–170.
76. Prochaska JO, DiClemente CC: Stages and processes of self-change of smoking: toward an integrative model of change. *J Consult Clin Psychol* 1983, **51**(3):390–395.
77. Scheier LM, Botvin GJ: Expectancies as mediators of the effects of social influences and alcohol knowledge on adolescent alcohol use: a prospective analysis. *Psychol Addict Behav* 1997, **11**(1):48–64.
78. Bott KE, Rumpf HJ, Bischof G, Meyer C, Hannover W, Hapke U, John U: Alkoholabstinenz-Selbstwirksamkeitsfragebogen: Deutsche Version der Alcohol Abstinence Self-Efficacy (AASE) Scale [Alcohol Abstinence Self-Efficacy-Scale, German Version]. In *Elektronisches Handbuch zu Erhebungsinstrumenten im Suchtbereich (EHES) [Electronic Handbook on Assessment Instruments in the Addiction Field], Volume 3*. Edited by Gloeckner-Rist A, Kufner FR, Kufner H. 2003 [http://www.gesis.org/unser-angebot/daten-erheben/zis-ehes/download-ehes/]
79. Himmelfarb S, Eagly AH, Chaiken S: The measurement of attitudes. In *Psychology of Attitudes*. Fort Worth: Harcourt Brace; 1993:23–88.
80. Glasgow RE, Vogt TM, Boles SM: Evaluating the public health impact of health promotion interventions: the RE-AIM Framework. *Am J Public Health* 1999, **89**(9):1322–1327.
81. Schmidt J, Lamprecht F, Wittmann WW: Zufriedenheit mit der stationären Versorgung. Entwicklung eines Fragebogens und erste Validitätsuntersuchungen [Satisfaction with inpatient treatment. Development of a questionnaire and preliminary validity checks]. *Psychother Med Psychol* 2002, **39**:248–255.
82. Stucki C: Die Therapiebeziehung differentiell gestalten. Intuitive Reaktionen, Patientenwahrnehmung und Beziehungsverhalten von Therapeuten in der Psychotherapie [Creating differential therapeutic alliances. Intuitive reactions, patient perception and therapeutic alliance in psychotherapy]. University of Bern 2004, [http://www.zb.unibe.ch/download/eldiss/04stucki_c.pdf]
83. Donner A, Klar N: Statistical considerations in the design and analysis of community intervention trials. *J Clin Epidemiol* 1996, **49**:435–439.
84. SAS Institute Inc: *What's new in SAS 9.3*. Cary, NC: SAS Institute Inc; 2012.
85. van Buuren S: Multiple imputation of discrete and continuous data by fully conditional specification. *Stat Methods Med Res* 2007, **16**(3):219–242.
86. Vasilaki EI, Hosier SG, Cox WM: The efficacy of motivational interviewing as a brief intervention for excessive drinking: a meta-analytic review. *Alcohol Alcohol* 2006, **41**(3):328–335.
87. Woolard R, Cherpitel C, Kathleen T: Brief intervention for emergency department patients with alcohol misuse: implications for current practice. *Alcohol Treat Q* 2011, **29**(2):146–157.
88. Thush C, Wiers R, Moerbeek M, Ames SL, Grenard JL, Sussman S, Stacy AW: Influence of Motivational Interviewing on Explicit and Implicit Alcohol-Related Cognition and Alcohol Use in At-Risk Adolescents. *Psychol Addict Behav* 2009, **23**(1):146–151.

89. Gartlehner G, Hansen RA, Nissman D, Lohr KN, Carey TS: **A simple and valid tool distinguished efficacy from effectiveness trials.** *J Clin Epidemiol* 2006, **59**:1040–1046.
90. Audrey S, Holliday J, Parry-Langdon N, Campbell R: **Meeting the challenge of implementing process implementation within randomized-controlled trials: The example of ASSIST (A Stop Smoking in Schools Trial).** *Health Educ Res* 2006, **21**(3):366–377.
91. de Vries H, Mudde A, Kremers S, Wetzels J, Uiters E, Ariza C, Vitoria PD, Fielder A, Holm K, Janssen K, Lehtuvuori R, Candel M: **The European Smoking Prevention Framework Approach (ESFA): short-term effects.** *Health Educ Res* 2003, **18**(6):649–663.
92. Vitale SG, van de Mheen H, van de Weil A, Garretsen HF: **Substance use among emergency room patients: is self-report preferable to biochemical markers?** *Addict Behav* 2006, **31**:1661–1669.
93. Harter M, Kentgens M, Brandes A, Bock T, Dirmaier J, Erzberger M, Furstenberg W, Hillebrandt B, Karow A, Von Dem Knesebeck O, König H-H, Lowe B, Meyer H-J, Romer G, Rouhiainen T, Scherer M, Thomasius R, Watzke B, Wegscheider K, Lambert M: **Rationale and content of psychenet: The hamburg network for mental health.** *Eur Arch Psychiatry Clin Neurosci* 2012, **262**(Suppl 2):S57–S63.
94. Kaner E: **Brief alcohol intervention: Time for translational research.** *Addiction* 2010, **105**(6):960–961.

doi:10.1186/1471-227X-14-13

Cite this article as: Diestelkamp *et al.*: Brief motivational intervention for adolescents treated in emergency departments for acute alcohol intoxication – a randomized-controlled trial. *BMC Emergency Medicine* 2014 **14**:13.

Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit



Publication II. Brief In Person Interventions for Adolescents and Young Adults following Alcohol-related Events in Emergency Care: A Systematic Review and European Evidence Synthesis

Reference. Diestelkamp, S., Drechsel, M., Arnaud, N., Baldus, C. & Thomasius, R. (2016). Brief in Person Interventions for Adolescents and Young Adults following Alcohol-related Events in Emergency Care: A Systematic Review and European Evidence Synthesis. *European Addiction Research*, 22, 17-35.

Format. published article

Brief in Person Interventions for Adolescents and Young Adults Following Alcohol-Related Events in Emergency Care: A Systematic Review and European Evidence Synthesis

Silke Diestelkamp Magdalena Drechsel Christiane Baldus Lutz Wartberg
Nicolas Arnaud Rainer Thomasius

German Center for Addiction Research in Childhood and Adolescence, University Medical Center
Hamburg-Eppendorf, Hamburg, Germany

Key Words

Emergency department · Adolescents · Young adults · Brief intervention · Alcohol-related event · Systematic review · Evidence synthesis

Abstract

Background: Increasing numbers of youth in need of emergency medical treatment following alcohol intoxication have been a major public health concern in Europe in recent years. Brief interventions (BIs) in the emergency department (ED) could prevent future risky drinking. However, effectiveness and feasibility of this approach are currently unclear. **Method:** A systematic literature search on controlled trials including participants aged 12–25 years treated in an ED following an alcohol-related event was conducted. Additionally, a grey literature search was conducted to support findings from the systematic review with evidence from practice projects and uncontrolled trials. Data on effectiveness, acceptance, implementation and reach were extracted. **Results:** Seven randomised controlled trials (RCT), 6 practice projects, 1 non-randomised pilot study and 1 observational study were identified. Six RCTs found reductions of alcohol use for all participants. Four RCTs found effects on alcohol consumption, alcohol-related risk-behaviour or referral to treatment. Participation and referral rates varied strongly, whereas data

on acceptance and implementation were rarely assessed. **Conclusion:** Heterogeneity of study designs and effects limit conclusions on effectiveness of BIs for young ED patients following an alcohol-related event. However, the number of practice projects in Europe indicates a need perceived by practitioners to address this population.

© 2015 S. Karger AG, Basel

Introduction

Adolescents in Europe start alcohol use and heavy use at an early age with 47% of European students report having been drunk at least once in their lifetime before the age of 15 to 16 [1]. Episodes of heavy drinking, that is, consumption of 5 (4 for girls) or more standard drinks on one occasion (binge drinking) [2], in the past 30 days are reported by 39% of 15- to 16-year-old European school children [1], a considerably higher prevalence than in the United States with 16% in the equivalent age group [3]. Recently, rising numbers of adolescents in need of emergency medical treatment due to acute alcohol intoxication (AAI) have attracted public attention in a number of European countries including Germany [4], the United Kingdom [5], Austria [6], Switzerland [7], the Netherlands [8], Croatia [9], Bulgaria [10] and the Slovak Republic

[11]. While adolescent drinking patterns such as the prevalence of alcohol use and binge drinking in the past 30 days and quantity of alcohol consumption on the latest drinking day vary considerably across European countries, alcohol-related hospitalisations do not vary as strongly across the different countries. An average of 3% (SD = 1.4) of 15- to 16-year-old students in Europe report having been hospitalised or admitted to an emergency room as a result of their alcohol use in the past 12 months [1].

Heavy episodic drinking at a young age is related to a number of negative short-term consequences such as violence (as a victim or perpetrator), unwanted or regretted sexual activities, drinking and driving as well as engagement in other risk behaviours increasing the likelihood of serious injuries [12–14]. Conflicts with parents, peers, teachers and police are often observed if heavy episodic alcohol consumption persists [15, 16]. Apart from short-term consequences repeated binge drinking episodes at an early age are associated with an increased risk of experiencing alcohol-related problems [12], impairments of neurocognitive functions [17, 18] and the development of an alcohol-related disorder later in life [19, 20].

In order to address the rising numbers of adolescent AAI patients in ED, some EDs in Europe have introduced brief interventions (BI) delivered before discharge from hospital [6, 7]. In Germany, the alcohol prevention project HaLT-Hart am Limit ('Stop – close to the limit') was developed to address the target population of underage AAI patients and 1 element of this project is the delivery of BIs in ED. The project is currently implemented at more than 170 locations nationwide [21]. However, effectiveness and feasibility of this approach are currently unclear.

Although a number of systematic reviews have addressed the effectiveness of BIs in the ED with mixed to positive results [22–24], only little is known about the effectiveness of BIs in ED for adolescents and young adults. Wachtel and Staniford [25] conducted a critical literature review on the effectiveness of BIs for adolescents in the clinical setting with inconclusive results. However, of the 14 studies included in the review only 4 were conducted in an ED. A systematic review by Yuma-Guerrero and colleagues [26] reviewed trials on BIs in ED targeting adolescent at-risk drinkers identified through screening. Four of the 7 included studies found significant intervention effects on at least 1 outcome related to alcohol consumption or consequences of alcohol use. However, the authors conclude that evidence is not clearly supporting effectiveness of screening, brief intervention and referral to treatment for this target population.

A first attempt to review evidence for effectiveness of BIs specifically targeting adolescents in the ED following an alcohol-related event was realized by Ahmed [27]. The rationale behind addressing patients following an alcohol-related event is that enhanced effectiveness of alcohol interventions was found for patients who attributed the need for ED treatment to their preceding alcohol consumption [28, 29]. The alcohol-related hospitalisation is assumed to create a teachable moment for alcohol interventions [29, 30]. Ahmed and Mackway-Jones [27] reported findings of 2 US-American [31, 32] and 1 Australian trial [33]. The author interpreted findings as generally supporting effectiveness of BIs in this context. A recent systematic review by Newton et al. [34] analysed a subset of 4 trials evaluating 'targeted' interventions (i.e. addressing adolescents whose ED visit was preceded by alcohol use) for adolescents in the ED. The authors conclude that targeted BIs did not yield clear benefits with regard to a reduction of alcohol use or alcohol-related problems. However, the small number of randomized-controlled trials (RCT) examined in these reviews limit conclusions that can be drawn. From a European perspective, it is also problematic that existing evidence is exclusively derived from US-American trials and one Australian trial [27, 34]. Different drinking patterns in adolescence as well as differences in health care systems and cultural contexts impose considerable concern as to whether results can be generalized to the European situation [1, 35].

Therefore, the aim of this literature review is to broaden the evidence base for BIs targeting adolescents and young adults following an alcohol-related event by including non-Anglo-Saxon evidence and evidence going beyond effectiveness such as parameters indicative of acceptance, participation and implementation. In doing so, we aim at providing an overview over the effectiveness, feasibility and current practice of BI delivery to adolescent and young adult ED patients following alcohol-related events in Europe. We used 2 strategies to achieve this. First, in contrast to existing reviews [26, 34], we conducted a systematic literature search on controlled trials addressing this population without applying language restrictions, thereby allowing identification of studies published in European languages other than English. In order to broaden the evidence base for BIs for this target group, we also included non-randomised controlled trials with other allocation methods (e.g. investigator assigns participants to groups) in the search. At the same time, we addressed the problem of methodological heterogeneity as reported in previous reviews [26, 34] by focusing our

search on BIs delivered in person. The problem of heterogeneity in study populations was addressed by focusing the search on BIs targeting adolescents in the presumed teachable moment of hospitalisation as a result of an alcohol-related event. Second, additional European evidence was sought stemming from other sources such as best practice reports, government documents or reports of uncontrolled trials. This approach follows the concept of a rapid evidence synthesis [36]. Originally developed as a tool for supporting policy makers' decision making, rapid evidence synthesis is an emerging method synthesizing a broad spectrum of evidence on a specific topic allowing for nonintervention studies to be included [36]. As a result, information on feasibility, implementation, process of intervention delivery, acceptance and receipt by patients and involved stakeholders are considered in order to support evidence from systematic reviews and meta-analyses [5, 37]. In order to provide an overview over effectiveness, feasibility and current implementation of this approach from a European perspective, it is useful to combine these 2 strategies. While the systematic review mainly provides evidence regarding effectiveness, the additional European evidence synthesis informs on feasibility and current implementation and therefore adds important dimensions for programme evaluation [38].

Method

First, we conducted a systematic review following the standards for reporting systematic reviews as put forward in the PRISMA statement [39]. In a second step, a grey literature search was conducted.

Systematic Review

Search Strategy

The literature search was conducted between May 5 and May 29, 2012 and was updated by e-mail alerts (Medline, CINAHL, Web of Science) up until October 20, 2014. The databases Medline, EMBASE, PubMed, Science Citation Index Expanded and Social Sciences Citation Index (Web of Science), PsycInfo, Database of Abstracts of Reviews and Effects (DARE), CINAHL, Cochrane Clinical Trials and Cochrane Database of Systematic Reviews, Psyn dex and Current Controlled Trials were searched for relevant records. The searches were not limited to a specific range of publication years and no language restrictions were applied.

Search terms for the study population were 'adolescen*', 'child*', 'youth' and 'young' each combined by the Boolean operator 'OR'. Search terms for the intervention were 'intervention', 'brief intervention', 'early intervention', 'psychotherapy, brief' each combined by 'OR'. The study outcomes were addressed by the search terms 'alcohol*', 'substance', 'ethanol', 'binge drinking', 'at-risk drinking', 'problem drinking', 'high-risk drinking', 'risky drinking', 'alcohol drinking', 'alcohol-related disorders' and 'alcoholic intoxication', again combined by 'OR'. The setting was ad-

ressed by the search terms 'hospital*', 'emergency department', 'emergency care', 'emergency service', 'hospital', 'emergency medical services', 'emergency medicine', 'emergency treatment', 'hospital department' and 'emergency services, psychiatric' combined by 'OR'. In a final step, all search results for the searches 'population', 'intervention', 'outcome' and 'setting' were combined by 'AND' to retrieve the relevant list of records.

In addition, we reviewed reference lists of relevant studies and systematic reviews to identify relevant publications that could have been missed in the systematic search process. Moreover, we reviewed conference proceedings to identify unpublished studies and the Current Controlled Trials database for trials with unpublished results.

Inclusion Criteria and Study Selection

We considered studies as relevant, if a BI was delivered to patients aged 25 years and younger treated for an alcohol-related event in the ED. The age range was chosen to cover the periods of adolescence and emerging adulthood as described by Arnett [40]. Records identified in the database searches and hand searches were screened for the following inclusion criteria:

- Study participants are aged between 12 and 25 years and are treated in an emergency care setting (inpatient or outpatient) following an alcohol-related event;
- The intervention is a brief intervention (maximum 60 min) consisting of a maximum of 3 sessions with a minimum of 1 session delivered in the ED;
- The intervention is focused on alcohol use and is delivered in person;
- The control condition consists either of no treatment, standard care, an intervention other than a BI or a BI of different intensity;
- Outcome measures address 1 or more of the following: alcohol consumption, alcohol-related risk behaviours, alcohol-related negative consequences and/or seeking of further alcohol treatment or counselling;
- The study design is a controlled trial with 1 or more follow-up assessments.

Two reviewers (SD, MD) independently screened titles and abstracts with regard to inclusion criteria and rated records whether they were clearly relevant (i.e. met all inclusion criteria) or clearly not relevant. If raters were indecisive or had reached different conclusions, consensus was obtained by discussion involving all authors. Where necessary, authors were contacted to provide additional information to aid the selection process.

Data Extraction and Quality Assessment

Two reviewers (SD, MD) independently conducted the extraction of data from the selected studies using a checklist that was developed on the basis of the Cochrane EPOC Data Collection Checklist [41]. Data were extracted with regard to the following aspects:

- Sample characteristics: sample size, age range, mean age, gender;
- Inclusion criteria for study participation;
- Study design and follow-up assessment points;
- Elements and duration of intervention and control condition;
- Interventionists' professional background, training and supervision;
- Outcomes;
- Participation rates, loss to follow-up, acceptance, implementation.

Any disagreement between raters was discussed and resolved by consensus. The methodological quality of the selected studies was assessed using the Cochrane Collaboration's tools for assessing risk of bias [42]. Two independent reviewers (SD, MD) conducted data extraction and again any disagreements were discussed and resolved by consensus involving all authors.

Additional Evidence Synthesis

Search Strategy

In order to collect additional evidence for effectiveness and feasibility of BIs in this context stemming from uncontrolled trials, best practice reports, government documents or press releases, web-based searches with the search engine 'google' were conducted using the keywords 'alcohol', 'alcohol intoxication', 'adolescents', 'underage', 'minor', 'emergency department', 'brief intervention' in combination with names of European countries. This search was repeated with keywords translated into the four most-spoken languages in the EU next to English, that is, German, French, Spanish and Italian. The first 10 pages of results of each search were screened for records meeting the inclusion criteria. Additionally, in order to collect information on projects not represented on the Internet or taking place in a country with a language not covered in our web search, researchers from 9 European countries (Sweden, the Netherlands, Czech Republic, Ireland, Catalonia, Great Britain, Switzerland, Croatia, France) who had published on relevant topics were contacted in person or by e-mail and asked if they could provide information on research or practice projects regarding ED-based BIs targeting adolescents following alcohol-related events in their respective countries. Additionally, search results of the systematic literature search were screened for relevant publications such as BI studies not conducted in a controlled design or reports on practice projects.

Inclusion Criteria

Records were included if they met the following criteria:

- Patients are aged between 12 and 25 years and are treated in an emergency care setting (inpatient or outpatient) following an alcohol-related event;
- The intervention is a brief intervention (maximum 60 min) consisting of a maximum of 3 sessions with a minimum of 1 session delivered in the ED;
- The intervention is focussed on alcohol use and is delivered in person;
- Reported information addresses 1 or more of the following: participation rates, acceptance, implementation and intervention effects on alcohol use, alcohol-related harm and referral to treatment.

Data screening and consensus procedures were equivalent to the procedure described earlier. Where necessary, authors were contacted to provide additional information to aid the selection process.

Data Extraction

Data were extracted on participation rates, acceptance, implementation, intervention content, facilitator's vocational background and intervention effects on alcohol use, alcohol-related harm and referral to treatment. Two independent reviewers (SD, MD) conducted data extraction and again any disagreements were resolved by consensus.

Results

Search Results Systematic Review

A total of 1,846 records were retrieved through database searches and an additional 9 records were identified through hand searches. The inclusion process is displayed in a flow chart according to the PRISMA statement [39] (fig. 1). Two reviewers (SD, MD) independently screened abstracts with an inter-rater agreement of 94.5%. A total of 1,445 records were excluded after screening of the abstracts, because they were clearly irrelevant. After removal of duplicates, a total of 236 full texts were retrieved. Records were excluded if they did not report on a controlled trial ($n = 83$), study participants did not meet the age range of 12–25 years ($n = 70$), the study did not take place in an ED ($n = 50$), the intervention was not focussed on alcohol use ($n = 17$) or study participants were not hospitalised as a result of an alcohol-related event (but for instance, identified through a positive alcohol screening) ($n = 46$). Another 16 records were excluded because they were secondary analyses of data reported in another publication. One of the 9 records identified through hand search was a conference abstract [43] describing a relevant study that could be retrieved online through a 'google' search [44]. A total of 7 studies met all inclusion criteria [31–33, 44, 46–48]¹.

Description of Included Studies

The 7 included studies were all randomized controlled trials of which 4 were conducted in the United States, 1 in Australia, 1 in Brazil and 1 in Germany.

Participants. Included studies represented a total sample size of 1,125, ranging from a minimum of 94 [32] to a maximum of 254 [44] participants. All except one study showed similar patterns of gender distribution with a weighted mean of 60.2% of participants being male. The study sample in Segatto et al. [46] represented an exception with 90.3% male participants (table 1).

Inclusion Criteria. All studies required self-reported alcohol use within 6 h prior to hospitalisation or alcohol use having led to hospitalisation as the central inclusion criteria. One study [47] additionally included individuals who screened 8 or higher on the Alcohol Use Disorders Identification Test (AUDIT) (23.7% of the total sample). Another study also included adolescents who presented to the ED following a drug-related event [33]. However,

¹ Data for [33] were also extracted from Tait et al. [45] where 4 months outcomes for the same trial were reported.

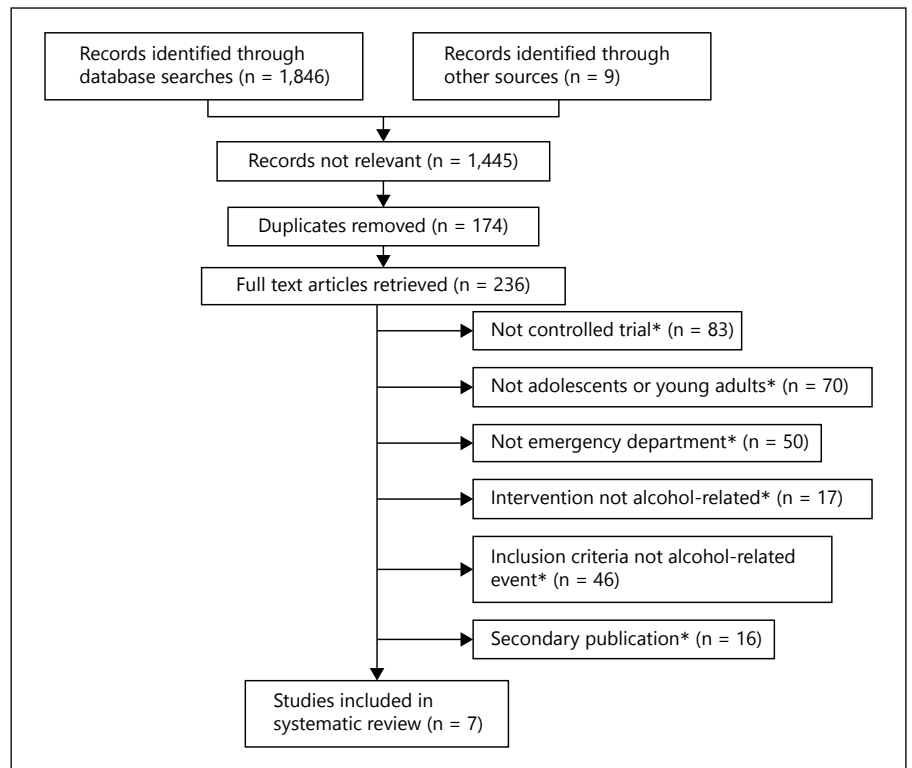


Fig. 1. Inclusion flowchart of studies for the systematic review according to the PRISMA statement (* multiple entries possible).

the majority (77%) of the sample reported having used alcohol prior to the ED visit.

Intervention Conditions. All interventions took place in the ED before discharge and lasted between 30 and 60 minutes. One study delivered 2 additional sessions, 1 addressing adolescents and parents together and 1 addressing parents only [48]. Of the remaining 6 studies, 1 reported offering counselling to parents in addition to the BI for the patients [44]. Six studies [31, 32, 44, 46–48] tested the effectiveness of a brief motivational intervention (BMI), thereby applying an approach based on the principles of motivational interviewing (MI) [49]. In 6 of the 7 studies, the primary intervention goal was harm reduction with regard to alcohol use, whereas 1 study [33] primarily targeted motivating patients to seek further alcohol-related treatment. Interventionists were either trained counsellors and psychologists [44, 46–48] or research staff [31–33] most of whom had received special training in MI [31, 32, 44, 46–48] with durations ranging from 15 h [48] to 30 h [47]. In 4 studies, interventionists additionally attended regular clinical supervisions [31, 32, 47, 48]. Some studies provided additional booster sessions by telephone [33, 47], online [44] or in person [48]. Frequency and durations varied from one booster with a duration not recorded [33] to two 20–30 min telephone

boosters including assessment and counselling [47] to 3 weekly web-based boosters lasting 10 min each [44].

Control Conditions. Five studies had minimal active control groups such as standard care [31–33], educational brochures [46] or feedback only [47]. Two studies compared a BI with an enhanced BI, that is, with an individual-level intervention plus family intervention [48] and an individual-level intervention plus computer-delivered exercises based on drinking motives, respectively [44].

Methodological Quality of Included Studies

The methodological quality of included studies assessed according to the Cochrane Collaboration's tools for assessing risk of bias [42] indicated reasonable to good quality (table 2).

Search Results Additional Evidence Synthesis

A total of 8 publications were identified containing additional information on BIs delivered to adolescent ED patients following an alcohol-related event of which 5 reported on projects or studies conducted in Germany, 2 in Austria and 1 in Switzerland (table 3). Four publications were retrieved from screening publications excluded from the systematic review. Three of those reported on practice projects [6, 7, 50] and 1 on the evaluation of a

Table 1. Characteristics of studies included in systematic review

Author, year, country	Sample size (% male); age range (mean age)	Study inclusion criteria	Study design; follow-ups	Intervention	Control condition
<i>Trials with minimal active control condition</i>					
Monti et al. (1999), USA	n = 94 (64); 18–19 (18.4)	Positive BAC or self-reported alcohol consumption that caused hospitalisation	RCT; 3, 6 months	MI (35–40 min) plus standard care (handout on drinking and driving, list of treatment agencies)	Standard care (5 min), handout on drinking and driving, list of treatment agencies
Segatto et al. (2011), Brazil	n = 175 (90.3); 16–25 (21.8)	Self-reported alcohol consumption related to the ED visit in the 6 h prior to hospitalisation	RCT; 3 months	MI plus educational brochure (45 min)	Educational brochure (5 min)
Monti et al. (2007), USA	n = 198 (67.7); 18–24 (20.5)	BAC >0.01%, or self-reported alcohol consumption in the 6 h prior to the event that caused hospitalisation or AUDIT score 8+	RCT; 6, 12 months	BMI (30–45 min), handouts on alcohol risks and treatment facilities, copies of feedback and worksheets, 2 telephone boosters consisting of assessment and counselling (20 min) at 1 month and assessment, counselling and feedback (25–30 min) at 3-month	Feedback only (1–3 min) handouts on alcohol risks and treatment facilities, copies of feedback, 2 telephone contacts consisting of assessment only (5–10 min) at 1 month and assessment plus feedback (10–5 min) at 3-month
Tait et al. (2005), Australia	n = 127 (55); 12–19 (16.7)	ED presentation involving AOD use. Identification 'through the ED information system and liaison with medical staff' (quote)	RCT; 4, 8, 12 months	BI (duration not recorded ^a) focussed on enhancing motivation for taking up further substance use treatment, 1 telephone booster	Standard care (duration not recorded ^b)
Spirito et al. (2004), USA	n = 152 (63.8); 13–17 (15.6)	Positive BAC or self-reported alcohol use in the 6 h prior to ED visit	RCT; 3, 6, 12 months	BMI (35–45 min)	Standard care (5 min)
<i>Trials with enhanced intervention control condition</i>					
Spirito et al. (2011), USA	n = 125 (46); 13–17 (15.4)	Positive BAC or self-reported drinking of alcohol in the 6 h before ED visit	RCT; 3, 6, 12 months	Individual BMI (45–60 min) plus family BMI (60 min family assessment, 60 min parent feedback), handout on substance use treatment agencies, 5 monthly brochures for parents	Individual BMI (45–60 min), handout on substance use treatment agencies, 5 monthly brochures for parents
Wurdak and Wolstein (2012), Germany	n = 254 (57.5); 14–17 (15.56)	Hospitalisation following alcohol intoxication	RCT; 1 month	Individual BMI plus drinking-motive based exercises on a tablet computer (10 min), parent counselling, 3 weekly drinking-motive based web-boosters (10 min each)	Individual BMI plus alcohol knowledge exercises on a tablet computer (10 min), parent counselling, 3 weekly alcohol knowledge web-boosters (10 min each)

eBI = Enhanced BI (i.e. individual plus family brief intervention); BAC = blood alcohol concentration.

^a Information obtained from written communication with author.

Table 2. Risk of bias assessed using the Cochrane Collaboration's tools for assessing risk of bias (Higgins and Green, 2011)

Bias	Author, year	Monti et al., 1999	Segatto et al., 2011	Monti et al., 2007	Tait et al., 2005	Spirito et al., 2004	Spirito et al., 2011	Wurdak and Wolstein, 2012
Random sequence generation (selection bias)	Low-risk Patients randomly assigned to groups	Low-risk Lottery system	Low-risk Quote: 'using a random numbers table'	Low-risk Quote: 'using a random numbers table'	Low-risk Quote: 'computer generated randomisation'	Low-risk Quote: 'using a random numbers table'	Low-risk Patients randomly assigned to groups	Low-risk Computer-generated randomisation
Allocation concealment (selection bias)	Unclear No information provided	Unclear No information provided	Unclear No information provided	Low-risk Quote: 'after the interview, an envelope containing a randomisation code (...) was opened'	Low-risk Quote: 'allocation was concealed in sealed envelopes' ^a	Low-risk Quote: 'condition assignments contained in sealed envelopes'	Low-risk Quote: 'condition assignments contained in sealed envelopes'	Low-risk Allocation was computer-generated during initial contact with participant
Blinding of participants and personnel (performance bias)	Unclear No information provided	High-risk Quote: 'patients were blinded to the intervention applied', personnel not blinded	Unclear No information provided	Unclear No information provided	High-risk Quote: 'participants were not blinded' ^a	Low-risk BI was conducted before randomisation to BI or eBI	High-risk Participants were blinded, facilitators were not blinded	
Blinding of outcome assessment (detection bias)	Low-risk Quote: 'by research assistants who were unaware of treatment condition'	Low-risk Quote: 'applied by an independent researcher'	Low-risk Quote: 'by research assistants blind to intervention condition'	High-risk Outcome assessment not blinded; data on subsequent ED presentations were collected blind	Low-risk Quote: 'by research assistants who were blind to treatment group assignment'	Low-risk Quote: 'by research assistants who were masked to treatment group assignment'	Low-risk Quote: 'by research assistants who were masked to treatment group assignment'	Low-risk Computer-based assessment
Incomplete outcome data (attrition bias)	Unclear Completion rates: 93% (3-month); 89% (6-month); quote: 'no differential follow-up rates between groups or by gender'; ITT analysis; no information on balance of reasons for missing data across groups	Low-risk Completion rates: 85% (3-month); reasons for missing data reported in detail and balanced across groups	Unclear Completion rates: 83% (6-month), 81% (12-month); rates (...) did not differ by gender or condition; ITT analysis; no information on balance of reasons for missing data across groups	Low-risk Completion rates: 53% (4-month); significant differences in 4-month follow-up completion rates across groups (p < 0.01); no significant difference in 12-month follow-up completion rates across groups; BI 63%, CG 73%; balanced reasons for missing data across groups ^a ; ITT analysis	Unclear Completion rates: BI: 93% (3-month), 89% (6-month), 89% (12-month); significantly different follow-up rates at 6-month follow-up (not significant at 3 and 12-month); no information on balance of reasons for missing data across groups	Unclear Completion rates: BI: 58% (12-month), eBI: 74% (12-month) Quote: 'there were no significant differences in follow-up rates between conditions'; no information on balance of reasons for missing data across groups	High-risk Completion rates: 40.7% (1 month), completion rates differed by frequency of high volume drinking and educational status; no information on balance of reasons for missing data across groups	

Table 2. (continued)

Bias	Author, year	Monti et al., 1999	Segatto et al., 2011	Monti et al., 2007	Tait et al., 2005	Spirito et al., 2004	Spirito et al., 2011	Wurdak and Wolstein, 2012
Selective reporting (reporting bias)	Low-risk Published report includes all expected outcomes	Low-risk Published report includes all expected outcomes	Low-risk Published report includes all expected outcomes	Low-risk Published report includes all expected outcomes	Low-risk Published report includes all expected outcomes	Low-risk Published report includes all expected outcomes	Low-risk Published report includes all expected outcomes	Low-risk Published report includes all expected outcomes
Other biases (other bias)	Intervention effect and therapist effect cannot be differentiated as only 1 therapist conducted interventions							

eBI = Enhanced BI (i.e. individual plus family brief intervention); ITT = intent-to-treat.
^a Information obtained from written communication with author.

project combining ED-based BIs with community-based prevention strategies [51]. The ‘google’ web search identified additional 3 publications. Two final reports to government bodies, 1 evaluating the dissemination of an alcohol prevention programme combining BIs in ED with community-based prevention [52] and 1 reporting on BIs in paediatric EDs in Berlin, Germany [53]. A press release on a practice project in an Austrian ED was also identified. After contacting project staff we were provided with an unpublished manuscript describing the project and its evaluation [54]. One additional publication was identified through personal communication with researchers, that is, a publication reporting on a pilot study not indexed in the 10 databases searched for the systematic review [55].

Description of Included Publications

With the exception of Stolle et al. [55], all publications report on BIs in the ED targeting those under 18 years and delivering a BI before discharge from hospital. Six publications reported on programmes already implemented into routine practice delivering BIs to adolescents following acute alcohol intoxication (AAI) [6, 7, 50, 52–54]. One publication reported on a pilot BI study with follow-up assessment at 6 months post intervention [55] and the remaining publication reported evaluation data on a project combining BIs in ED with community-based prevention strategies [51]. In this study, AAI prevalence was compared between a project region and a control region. Other publications did not include control conditions. Five of the publications [50–54] reported on the programme HaLT-Hart am Limit (‘Stop – close to the limit’) or adaptations thereof. Six publications reported that parents or caregivers were offered counselling as well when they arrived in hospital to pick up their child [6, 7, 50, 52–54]. A detailed description of publications is depicted in table 3.

Key Findings of Systematic Review and Additional Evidence Synthesis

Alcohol Consumption

All except one study [33] with follow-up assessments [31, 32, 44, 46–48, 55] observed reductions of alcohol consumption following the ED visit regardless of the form of care (table 4). Two studies found significant differences across conditions for alcohol consumption-based outcomes. Monti and colleagues [47] observed significantly greater reductions in the intervention group in the number of past-month drinking days at 6 ($F = 6.34$; $p = 0.01$) and 12-month follow-up ($F = 11.02$; $p \leq 0.001$) as well as the number of past-month heavy drinking days

Table 3. Characteristics and key findings of additional evidence synthesis

Author, year, country	Sample size (% male); age range (mean age)	Publication type; study design/content of publication	Study/project inclusion criteria	Follow-ups; loss to follow-up	Intervention; interventionists	Intervention effects on alcohol-related outcomes; referral rate	Participation rate; acceptance; implementation
Fandler et al. (2008), Austria	<18 (15.5)	Journal article; cross-sectional access-to-care sample characterisation and project description	Treatment in a paediatric ED following acute alcohol intoxication	No follow-up	BI addresses youth and caregivers, informs about consequences of underage alcohol use, AAI and youth protection law. Psychosocial risk factors are addressed in order to determine need for further treatment; psychologist (weekdays), medical doctor (weekends)	-; -	-; -; -
Cafilisch et al. (2013), Switzerland	356 (42%); 9.2–17.4* (14.9)*	Journal article; cross-sectional access-to-care sample characterisation and project description	Treatment in a paediatric ED following acute alcohol intoxication	No follow-up	BI with adolescents in ED and BI caregivers within 10 days after ED visit addressing context and risks of AAIs, drinking patterns, consequences of underage drinking, parenting, goal setting, strategies for achieving drinking goals. Referral to youth-specific substance use counselling or psychiatric services if indicated; -	-; 88%	82.8%*; -; -
Müller et al. (2009), Germany	128 (55.5); <18 (15.5)	Journal article; cross-sectional access-to-care sample characterisation and project description	Treatment in an ED following acute alcohol intoxication	No follow-up	Youth and caregivers receive standardized BI (45 min), at-risk alcohol consuming youth are referred to a youth specific group programme; trained youth- and substance use counsellors	-; -	88.3%; -; -
Reis et al. (2009), Germany	182 (59); <18 (15.3)	Journal article; evaluation of a project combining BIs in ED with community-based alcohol prevention strategies by comparing AAI prevalence in 2 regions (experimental vs. control)	Treatment in an ED following acute alcohol intoxication	No follow-up	BI including MI elements addressing context and risks of AAIs, drinking patterns, consequences of underage drinking, goal setting, strategies for achieving drinking goals. Standardized psychiatric and substance use assessment resulting in referral to either detoxification, inpatient treatment, psychotherapy or experience-oriented group programme; child and adolescent psychiatrist	12-month AAI prevalence dropped by 20% in the experimental region and increased by 33% in the control region; -	83.1%; -; -
Fenzl et al. (submitted), Austria	175 (58); <18 (15.9)	Journal article; cross-sectional access-to-care sample characterisation and project description	Treatment in a paediatric ED following acute alcohol intoxication	3–4 months follow-up; -	BI for adolescents and caregivers addressing consequences of underage alcohol use, aiming at motivating to take up further treatment; ED staff members	-; 25.1%	21.7%; -; -

Table 3. (continued)

Author, year, country	Sample size (% male); age range (mean age)	Publication type; study design/content of publication	Study/project inclusion criteria	Follow-ups; loss to follow-up	Intervention; interventionists	Intervention effects on alcohol-related outcomes; referral rate	Participation rate; acceptance; implementation
Stolle et al. (2013), Germany	88 (48.9); <21 (16.4)	Journal article; pilot study with one intervention group, no control group	Treatment in an ED following acute alcohol intoxication	6-month follow-up; 11.4%	Semi-structured 40 min brief motivational intervention; external advanced medical students	Quantity of alcohol use (g/l in past 30 days) significantly reduced at 6-month follow-up (M = 544 (SE = 102) vs. M = 358 (SE = 108), $p < 0.05$); 17%	-; -; -
Prognos AG (2008), Germany	764 (59); <18 (15.5)	Final report to government body; cross-sectional access-to-care sample characterisation and project description	Treatment in an ED following acute alcohol intoxication	No follow-up	BI addresses youth and caregivers, is based on MI and aims at supporting youth to reflect upon at-risk alcohol use and consequences and referring them to an experience-oriented programme especially developed for this target group; trained external facilitators with different vocational backgrounds	-; -	-; -; project implementation (BI in ED and community-based alcohol prevention) was strongly dependent on support from relevant opinion leaders in the community
Delphi (2010), Germany	339 (44.9); <18 (15.6)	Final report to government body; cross-sectional assessment of post intervention data and comparison with representative reference sample	Treatment in an ED following acute alcohol intoxication	One overall assessment point resulting in varying individual assessment points (1–18 months post intervention); 60.9%	BI addresses youth and caregivers, is based on MI and provides information on consequences of alcohol use, promotes sensible drinking and refers to an experience-oriented programme and further treatment if indicated; -	In BI group lower alcohol abstinence rates (53.8 vs. 71.4% for <16 year-olds, 14.7 vs. 23.8% for >16 year-olds) and higher 30-day binge-drinking prevalence (60 vs. 20%); 20% took part in experience-oriented group programme/18.3% took up further medical or psychiatric treatment	-; 77.5% for participants who would recommend the BI to a friend, staff in 6 of 10 clinics rated BI implementation a valuable addition to TAU; -

'-' = Indicates 'no information provided'; TAU = treatment as usual.
* Information obtained from written communication with author.

Table 4. Measures, key findings and potential limitations of studies included in systematic review

	Drinking quantity	Drinking frequency	Frequency of high volume drinking	Alcohol-related problems	Drinking and driving	Alcohol-related injuries	Referral to treatment	Summary of intervention effects on alcohol-related outcomes; referral rate	Participation rate; acceptance; implementation; limitations
<i>Trials with minimal active control condition</i>									
Monti et al., 1999	ADQ	ADQ	ADQ	5 items from HBQ	YADDQ	AIC	Yes/no	Drinking and driving declined significantly in BI group; participants in BI group were less likely to experience alcohol-related injury, significantly fewer alcohol-related problems were reported in BI group, alcohol consumption (ADQ total score) declined in both groups with no inter-group differences; no differences in seeking additional treatment	67%; not assessed systematically, but findings clearly demonstrate the intervention's acceptability and feasibility' (p 992); drop-outs differed from follow-up completers in drinking days and frequency of heavy drinking; high number of study participants who generally consumed low levels of alcohol, which made it difficult to detect effects
	Between-group difference; effect size (Cohen's d)	n.s.; n/a ^a	n.s.; n/a ^a	6 months ^b ; p < 0.05, d = 0.42	6 months ^b ; p < 0.05, d = 0.75	6 months ^b ; p < 0.01, d = 0.76	n.s.; 6 months: d = 0.12		
Segatto et al., 2011	ACQ	ACQ	ACQ	RAPI	ACRQ	-	-	Significant reduction in alcohol consumption in both groups, no inter-group differences, significant reductions of negative alcohol-related harm in both groups with no inter-group differences; -	97.8%; -; -; special sample characteristics: 90.3% male and high percentage of alcohol dependents (37.9% in BI, 35.2% in CG); short follow-up period, all BIs conducted by the same interventionist
	Between-group difference; effect size (Cohen's d)	n.s.; n/a ^a	n.s.; 3 months: d = 0.27	n.s.; 3 months: d = 0.04	n.s.; 3 months: d = 0.31	-	-		
Monti et al., 2007	TLFB	TLFB	TLFB	RAPI	Frequency of driving within 1 hour after drinking	AIC	Yes/no	BI group reduced number of drinking days, heavy drinking days and drinks per week from	66.8%; -; -; follow-up completers differed in drinking days, heavy drinking days, drinks per week from non-completers (completers reporting higher scores)
	Between-group difference; effect size (Cohen's d)	6 months: p = 0.01, d = 0.24 12 months: p < 0.001, d = 0.30	6 months: p = 0.01, d = 0.24 12 months: p < 0.001, d = 0.34	n.s.; 12 months: d = 0.02	n.s.; 12 months: d = 0.03	n.s.; 12 months: d = 0.08	n.s.; 12 months: d = 0.23	BI group reduced number of drinking days, heavy drinking days and drinks per week from non-completers (completers reporting higher scores)	66.8%; -; -; follow-up completers differed in drinking days, heavy drinking days, drinks per week from non-completers (completers reporting higher scores)

Table 4. (continued)

	Drinking quantity	Drinking frequency	Frequency of high volume drinking	Alcohol-related problems	Drinking and driving	Alcohol-related injuries	Referral to treatment	Summary of intervention effects on alcohol-related outcomes; referral rate	Participation rate; acceptance; implementation; limitations
Tait et al., 2005	Measure AUDIT-3	AUDIT-3	AUDIT-3	-	-	-	Yes/no	BI group showed significant reductions in AOD-related ED presentations from pre- to post enrollment; at 4-month follow-up significantly more participants from BI group attended further treatment	69%; -; -; significant differences in hazardous alcohol use between groups at baseline
	Between-group difference; effect size (Cohen's d)	n.s.; n/a ^a	n.s.; n/a ^a	-	-	-	4 months: p < 0.001, d = 0.70		
Spirito et al., 2004	Measure	ADQ	ADQ	5 items from HBQ	YADDQ	AIC	Yes/no	Both groups significantly reduced quantity of drinking at 3, 6 and 12-month follow-ups, a subgroup of participants who scored above the cut-off for referral for alcohol treatment at baseline reported lower drinking frequency and lower frequency of heavy drinking in the BI group than in CG at 3, 6 and 12 months follow-ups; -	53.1%; participants rated facilitators' competency (rapport, empathy, self-efficacy enhancement) as high; -; school drop outs were less likely to complete 6-month follow-up; rates of follow-up alcohol-related problems were relatively low making it difficult to detect effects
	Between-group difference; effect size (Cohen's d)	n.s.; 3 months: d = 0.19 6 months: d = 0.05 12 months: d = 0.04	n.s.; 3 months: d = 0.21 6 months: d = 0.02 12 months: d = 0.41	n.s.; n/a ^a	n.s.; n/a ^a	n.s.; n/a ^a	n.s.; n/a ^a		
Spirito et al., 2011	Measure	ADQ	ADQ	-	-	-	-	Drinking quantity, drinking frequency and frequency of high volume drinking declined significantly in both groups. High volume drinking at 3-month follow-up was significantly lower in the eBI group than in BI group; -	47.3%; -; return visits to complete eBI proved problematic for 20% of families, 'the addition of the family component is more challenging' (p 273); no 'no intervention' control group, low completion rates at 12-month follow-up (BI: 58%, eBI: 74%)
	Between-group difference; effect size (Cohen's d)	n.s.; 3 months: d = 0.28 6 months: d = 0.28 12 months: d = 0.12	n.s.; 3 months: d = 0.25 6 months: d = 0.18 12 months: d = 0.05	3 months: p = 0.48 3 months: d = 0.19 6 months: d = 0.18 12 months: d = 0.23	-	-	-		

Table 4. (continued)

Wurdak and Wolstein, 2012b	Measure	Drinking quantity	Drinking frequency	Frequency of high volume drinking	Alcohol-related problems	Drinking and driving	Alcohol-related injuries	Referral to treatment	Summary of intervention effects on alcohol-related outcomes; referral rate	Participation rate; acceptance; implementation; limitations
		'Items derived from Kraus et al., 2008'	'Items derived from Kraus et al., 2008'	'Items derived from Kraus et al., 2008'	-	-	-	-	Both groups significantly reduced drinking frequency and binge drinking frequency at 1-month follow-up. Females in the eBI group reduced drinking frequency and binge drinking frequency significantly stronger than in BI group at 1-month follow-up; -	Approximately 80% (facilitators estimation); 75.9% of participants rated the intervention as 'very good', 'good' or 'satisfactory', no significant between group differences; facilitators rated feasibility of eBI as 'good' to 'satisfactory'; significantly lower educational status in intervention group, low follow-up completion rate (40.7%), follow-up completers reported significantly fewer days of excessive alcohol use and higher educational status than non-completers
	Between-group difference; effect size (Cohen's d)	n.s.; n/a ^a	n.s.; n/a ^a	n.s.; n/a ^a						

ADQ = Adolescent drinking questionnaire; HBQ = health behaviour questionnaire; YADDQ = young adult drinking and driving questionnaire; AIC = adolescent injury checklist; CG = control group; ACQ = alcohol consumption questionnaire; RAPI = Rutgers alcohol problem index; ACRO = alcohol consumption risk questionnaire; TLFB = time-line follow-back; AUDIT-3 = first 3 questions from the alcohol use disorder identification test; eBI = enhanced brief intervention, i.e. individual plus family brief intervention; GHQ = general health questionnaire; n.s. = not significant.

^a Effect size calculation not possible from published data; ^b data from 3- and 6-month follow-up were added to analyse group differences.

at 6 ($F = 9.49$; $p = 0.01$) and 12-month follow-up ($F = 8.20$; $p = 0.01$). Significant between-group differences were also observed on past-month average number of drinks per week at 6- ($F = 7.98$; $p = 0.01$) and 12-month follow-up ($F = 10.35$; $p < 0.01$). Spirito et al. [48] observed a significant effect of the enhanced BI (eBI) on high-volume drinking days, defined as consuming more than 5 drinks per occasion, at 3-month follow-up (14.6 vs. 32.1%; $p = 0.048$). Two studies found significant between-group differences in reductions of alcohol use for subgroups. Spirito and colleagues [31] found a significant effect of the intervention on drinking days per month ($F(1, 120) = 7.05$; $p < 0.01$) and frequency of high-volume drinking at 3-, 6- and 12-month follow-up ($F(1, 120) = 10.04$; $p < 0.01$) for patients who screened positive for referral to alcohol treatment at baseline. Wurdak and Wolstein [44] found significantly stronger reductions in drinking frequency ($F = 7.85$; $p = 0.009$) and high-volume drinking frequency ($F = 7.08$; $p = 0.012$) for females in the eBI group. Both studies [31, 44] did not find significant between-group difference in alcohol use in the overall sample. In addition to the effect sizes reported in table 4, we calculated combined effects for the 3 alcohol consumption outcomes drinking quantity, drinking frequency and frequency of high-volume drinking. Relevant data for effect size calculation were published in 4 of the 7 RCTs and combined effects on alcohol consumption ranged from 0.19 [31, 48] to 0.20 [46] and 0.25 [47].

Alcohol-Related Harm

Of the 4 studies that assessed differences in reductions of alcohol-related problems in BI and control groups [31, 32, 46, 47], only 1 [32] reported significantly stronger reductions in the BI group at 6-month follow-up compared to the standard care group ($F(1, 78) = 4.10$; $p < 0.05$). Four studies assessed intervention effects on drinking and driving. One study [32] found a significant effect favouring the intervention group ($\chi^2(1, n = 73) = 5.82$; $p < 0.05$). The effect of the BI on alcohol-related injury was assessed in 3 studies [31, 32, 47]. Again, only 1 study [32] reported a significant effect of the intervention on the quantity of alcohol-related injuries ($\chi^2(1, n = 82) = 7.72$; $p < 0.01$). In this study, a significant decline in moving violations in the intervention group at 6-month ($\chi^2(1, n = 62) = 5.17$; $p < 0.05$) was also observed.

Referral to Treatment

Seven of the 15 publications identified in the systematic literature and additional evidence search assessed whether study participants accessed alcohol treatment or

counselling following the BI [7, 32, 33, 47, 53–55]. Referral rates in BI groups ranged from 17% [54] to 88% [7] with a mean referral rate of 35.4%. Only 1 of 4 studies comparing referral rates in a BI group with a control group reported significant intervention effects with patients in the intervention group reporting higher numbers in referral to treatment ($\chi^2(1) = 22.3$; $p < 0.001$) at 4-month follow-up [33].

Participation Rates

Of the 15 publications a total of 11 reported data on the ratio of those eligible and youth receiving a BI. On average, 68.8% of eligible youth agreed to take part in the BI. Participation rates ranged from 21.7% [54] to 97.8% [46].

Acceptance

Acceptance of the BI by patients or clinic staff was systematically assessed in 3 studies [31, 44, 53]. In Wurdak and Wolstein [44], 75.9% of participants rated their overall impression of the intervention as 'very good', 'good' or 'satisfactory' when asked immediately following the BI. Furthermore, participants rated the BI on a 5-point scale (1 = agree, 5 = not agree) as 'helpful' ($M = 4.21$, $SD = 1.01$) and felt being taken seriously ($M = 4.04$, $SD = 1.20$). At 1-month follow-up, ratings were slightly lower with $M = 3.67$ ($SD = 1.29$) for perceiving the BI as 'helpful'. In another study [53], 77.5% of participants reported they would recommend the BI to a friend in a similar situation and 60% of clinic staff rated the BI programme as being a valuable addition to ED standard care. Spirito et al. [31] asked study participants to rate counselor's perceived empathy, rapport and self-efficacy enhancement with generally positive ratings of 3.7–3.8 on a 4-point scale ranging from 1 (strongly disagree) to 4 (strongly agree). Originally introduced as a measure for protocol adherence, these ratings also reflect patients' acceptance of the intervention. Authors of 5 publications [6, 7, 50, 52, 54] reported that the BI programmes were initiated by clinic staff as a result of a perceived increase in numbers and symptom severity of those under 18 years treated for AAI, which indicates high motivation of clinic staff to implement and support BI programmes.

Implementation

Data on implementation were reported in 3 of the 15 publications [44, 48, 52]. Facilitators rated the feasibility of BI delivery as 'good' to 'satisfactory' ($M = 2.76$, $SD = 1.33$) on a 6-point scale ranging from 1 = very good to 6 = very bad in 1 study [44]. Qualitative interviews in another publication [52] revealed that the implementation of a project combining BIs in ED with community-based al-

cohol prevention was strongly dependent on the support of relevant stakeholders in the community. Another study [48] reported that return visits including patients' family members were problematic for 20% of participants.

Booster Sessions

Four studies included BIs with booster sessions [33, 44, 47, 48]. Spirito et al. [48] found a significant effect at 3-month follow-up in reducing high-volume drinking when a booster session with parents and a parent feedback session were added to the BI. Monti et al. [47] compared a BI including two booster sessions by telephone with standard care and found significant reductions in the BI group on all assessed alcohol consumption measures at 6- and 12-month follow-up. Tait et al. [33] compared a BI including a telephone booster with standard care and found a significant effect of the intervention on the target outcome, which was taking up further treatment. Wurdak and Wolstein [44] applied 3 weekly web-based boosters focusing on drinking motives (enhanced BI) or alcohol knowledge (control condition) and found reductions on frequency of alcohol use and heavy use in both groups with females in the enhanced BI condition reporting significantly stronger reductions on these outcomes. The three studies that did not add booster sessions to the interventions yielded either no between-group effects [46], significant effects on alcohol-related harm only [32] or significant intervention effects only for a subgroup of patients with problematic alcohol consumption at baseline [31].

Discussion

This review identified seven RCTs evaluating effectiveness of alcohol BIs in ED for adolescents and young adults following an alcohol-related event and eight additional publications on practice programmes or uncontrolled trials. In contrast to existing reviews [26, 34], this is the first review to identify European evidence for this approach. It is also the first review to support evidence on effectiveness with data on implementation, acceptance and reach of BIs for this target population, essential dimensions for programme evaluation according to the RE-AIM framework [38]. Although a considerably higher number of RCTs than in previous reviews was included [27, 34], evidence of effectiveness of BIs for this target population remains inconclusive. Four of the 7 RCTs found beneficial effects of BIs on alcohol consumption or alcohol-related harm for the overall sample or for subgroups reporting small to medium effect sizes. However, effects relate to

heterogeneous outcomes and are limited to a small share in assessed outcomes. None of the studies found effects on both alcohol consumption and alcohol-related harm. Only one of four trials provided evidence supporting effectiveness of BIs in increasing rates of referral to further treatment. The heterogeneity of study methodologies, particularly with regard to control conditions (minimal active vs. enhanced BI) and booster delivery modes (in person including parents [48] vs. telephone [47] vs. web-based [44]) and frequencies (1 [45, 48], 2 [47] or 3 [44]) precluded combining effects with a meta-analysis.

Participation rates as assessed in 11 publications varied strongly, a finding that underlines the importance of systematic process evaluation in order to identify factors contributing to variations in participation rates. Measures on acceptance revealed generally favourable appraisals, but were rarely assessed ($n = 3$), mainly focussing on acceptance by patients and only in one case by clinic staff. Few publications contained information on BI implementation ($n = 3$). Reported measures focussed on heterogeneous aspects of implementation such as feasibility of BI delivery rated by facilitators [44], structural prerequisites of BI implementation from a community perspective [52] and feasibility of return visits with family members [48], limiting generalisability of findings and highlighting the need for a more standardized and comprehensive approach to implementation evaluation.

Overall, it has to be noted that there are substantial activities under way in Europe to provide BIs in EDs to children and adolescents following an alcohol-related event. The majority of publications on such programmes originate from Germany, followed by Austria and Switzerland. This finding is likely due to varying degrees of programme implementation in European countries, among which Germany takes on a special role with project 'HaLT-Hart am Limit' ('Stop – close to the limit') implemented at more than 170 locations across the country. Many of the identified practice projects were initiated by hospital staff [6, 7, 50, 52, 54] as a reaction to rising numbers of alcohol-intoxicated minors treated in EDs, a fact that reflects the articulate need perceived by practitioners to address this target group with appropriate support. In addition to these programmes which provide BIs in ED, a number of programmes exist in Europe, which cater to adolescents with alcohol intoxication with different support, for example, the Dutch programme 'Jeugd en Alcohol', which offers adolescents with AAI a counselling and educational session at a scheduled re-visit a couple of weeks after hospitalisation [56, 57] or the Swedish Maria Ungdom, which offers treatment for adolescents with AAI in a specialised

clinic for adolescents with problematic alcohol and other drug use [58], again underlining the need perceived by practitioners to address this target group.

Several reasons may account for the inconclusive findings of this review regarding the effectiveness of BIs in this context. The fact that none of the studies found effects on both alcohol consumption and alcohol-related harm could be due to different contents of the BIs. Monti et al. [32] for example, stated that the BI applied in their study did not emphasize a reduction in alcohol consumption, but focussed on promoting behaviours to reduce alcohol-related harm. The same applies for Tait et al. [33] who tested an intervention that primarily focussed on enhancing motivation for further treatment instead of a reduction in alcohol consumption. Heterogeneity of study methodologies due to different control conditions as well as different numbers and modes of booster sessions also limits comparability of findings. Albeit focussing on studies and programmes targeting adolescents following an alcohol-related event, it needs to be noted that some heterogeneity in the study populations remained, for example, Wurdak and Wolstein [44] only included adolescents treated for an AAI, while other studies generally included adolescents who consumed alcohol prior to the ED visit. It remains unclear if adolescent patients treated for an alcohol-related injury respond differently to the BI. Small sample sizes in some RCTs made it difficult to detect intervention effects for variables with low rates of baseline manifestation as reported, for example, by Spirito et al. [31] for alcohol-related problems and by Monti et al. [32] for alcohol consumption. BMIs have proven to be effective in adolescent populations also for other health behaviours such as smoking and peer violence; however, it has to be taken into account that effects are typically small [59–61]. Small effects may partly be explained by a finding by Mallett et al. [62], who found college students who have experienced negative consequences from alcohol use to be at an increased risk of experiencing similar consequences in the future, indicating that they did not learn from their mistakes.

All except one RCT [33] found reductions in alcohol consumption in both intervention and control groups following the ED visit. Changes in drinking in control groups are often observed in BI studies and factors such as assessment reactivity, research participation effects, regression to the mean and maturation have been identified to contribute to this finding [63, 64]. Furthermore, due to ethical considerations control group participants received some kind of an active intervention in all studies included in this review, potentially contributing to a sys-

tematic underestimation of effects under real-world conditions. On the other hand, it is also possible that the ED visit itself represents an event that triggers behaviour change [65] in a way that BIs do not add a significant additional effect, potentially even more so for young individuals treated following an alcohol-related event. Segato et al. [46] reported the only RCT that did not find positive effects of the BI on any outcome. In this study, the sample differed strongly from those in the other RCTs with a high percentage (37.9% in BI, 35.2% in control group), screening positive for alcohol dependence. BIs for alcohol-dependent patients have been found to be not as effective as for non-dependents [66–68].

Against the background of typical alcohol consumption patterns in adolescence, that is, infrequent heavy drinking [69, 70] it can be questioned whether average quantity of alcoholic drinks consumed over a given period of time and consumption frequency of any quantity of alcohol are appropriate main outcomes to capture intervention effectiveness in this context. Taking into account the harm-reduction approach applied by most BIs in this context, the frequency of high-volume drinking and quantity of alcohol consumption on a typical drinking occasion as well as experience of negative alcohol-related harm could be more appropriate outcome measures to depict risky adolescent drinking.

All RCTs in this review included patients who received ED treatment following the consumption of alcohol. However, none of the studies assessed whether or to what extent patients actually attributed their ED visit to the preceding alcohol use, a fact that could provide additional information contributing to the understanding of differential intervention effects [28].

Conclusions that can be drawn from the current review are limited in several ways. Because of the small number of relevant RCTs it was not feasible to determine publication bias with a funnel plot. However, unpublished studies were sought through a trials registration database, by screening conference proceedings and reference lists, and additional evidence was sought in a grey literature search. The grey literature search cannot meet the claim of completeness and it can only describe programmes published in some kind of a report. Expert contacts for this review were restricted to authors who had published on relevant topics. Furthermore, the age group addressed in this review was 12–25 years, resulting in the inclusion of young people in different developmental stages. Although alcohol BMIs with college-aged participants have a strong evidence base [67], doubts have been expressed whether the MI approach is effective for young

teenagers [34, 71]. In order to determine differential effectiveness of BIs for different age groups in this setting, further studies investigating larger samples including children, adolescents and young adults are needed.

Future European research into effectiveness and feasibility of BIs targeting adolescent ED patients following an alcohol-related event is needed, because rising numbers of adolescent AAI patients pose a major public health concern in Europe and numerous practice projects initiated by clinicians reflect the perceived need for effective interventions addressing this population. Replications of successful RCTs would be desirable in order to establish a pool of studies with comparable designs that allow synthesizing of results. Furthermore, research with minimal assessment would be desirable in order to minimize assessment reactivity and evaluate effects under 'real-world' conditions. Additionally, the investigation of potential moderators and mediators of effectiveness would be desirable in order to shed light on factors contributing to differential effectiveness of alcohol BIs targeting adolescents after alcohol-related events and thereby contributing to understanding the heterogeneity of existing findings.

Conclusion

Through the unique combination of a systematic review and additional evidence synthesis, this review provided an overview over evidence for BIs in ED for adoles-

cents and young adults following an alcohol-related event that goes beyond effectiveness by including evidence on current implementation, acceptance and reach. In Europe to date, a number of BI programmes targeting adolescents in EDs following alcohol-related events are implemented in clinical practice, whereas evidence regarding their effectiveness and feasibility is limited. The identified gap between current implementation and clinicians' perceived need for programmes addressing this population on the one hand and the inconsistent evidence for effectiveness and feasibility on the other hand needs to be addressed by future research.

Acknowledgements

This review was prepared as part of the research project Health network 'alcohol abuse in adolescence': improved access-to-care for children and adolescents with at-risk alcohol use, which constitutes a sub-project of psychenet – the Hamburg Network for Mental Health [72]. The research and development project psychenet (2011–2014) is supported by the German Federal Ministry of Education and Research (grant number 01KQ1002B) and aims at strengthening health care regions in Germany by establishing new transsectoral cooperations and implement and evaluate selected innovations. Further information and a list of all project partners can be found at <http://www.psychenet.de>.

Disclosure Statement

The authors have no conflict of interest to disclose.

References

- 1 Hibell B, Guttormsson U, Ahlström S, Balakireva O, Bjarnason T, Kokkevi A, Kraus L: The 2011 ESPAD Report. Substance Use Among Students in 36 European Countries, 2012. http://www.espad.org/Uploads/ESPAD_reports/2011/The_2011_ESPAD_Report_FULL_2012_10_29.pdf (accessed November 3, 2012).
- 2 Herring R, Berridge V, Thom B: Binge drinking: an exploration of a confused concept. *J Epidemiol Community Health* 2008;62:476–479.
- 3 Johnston LD, O'Malley PM, Miech RA, Bachman JG, Schulenberg JE: Monitoring the Future National Results on Drug Use: 2013 Overview, Key Findings on Adolescent Drug Use. Ann Arbor, Institute for Social Research, 2014.
- 4 Gesundheitsberichterstattung des Bundes: Diagnosedaten der Krankenhäuser ab 2000. Federal Health Statistics: Data on Diagnoses in Hospitals from 2000. http://www.gbe-bund.de/oowa921-install/servlet/oowa/aw92/WS0100/_XWD_FORMPROC?TARGET=&PAGE=_XWD_106&OPINDEX=4&HANDLER=_XWD_CUBE.SETPGS&DATACUBE=_XWD_134&D.001=1000001&D.002=25&D.003=1000004&D.972=1000619&D.100=10101 (accessed February 2, 2014).
- 5 Healey C, Rahman A, Faizal M, Kinderman P: Underage drinking in the UK: changing trends, impact and interventions. A rapid evidence synthesis. *Int J Drug Policy* 2014;25:124–132.
- 6 Fandler E, Scheer P, Rödl S, Müller W: Alkoholmissbrauch und –abhängigkeit bei Kindern und Jugendlichen [Alcohol misuse and dependence in children and adolescents]. *Monatsschr Kinderheilk* 2008;156:591–604.
- 7 Caffisch M, Uldry V: [At the crossover of adolescent and alcohol]. *Rev Med Suisse* 2013;9:406–409.
- 8 Van Hoof JJ, Lely NV, Pereira RR, van Dalen WE: Adolescent alcohol intoxication in the Dutch hospital departments of pediatrics. *J Stud Alcohol Drugs* 2010;71:366–372.
- 9 Bitunjac K, Saraga M: Alcohol intoxication in pediatric age: ten-year retrospective study. *Croat Med J* 2009;50:151–156.
- 10 Loukova A: Study of acute alcohol poisoning in children admitted to a emergency hospital Pirogov in Sofia, Bulgaria. *Macedonian J Med Sci* 2011;4:275–280.
- 11 Kuzelová M, Harárová A, Ondriasová E, Wawruch M, Riedel R, Benedeková M, Kovács L, Plaková S: Alcohol intoxication requiring hospital admission in children and adolescents: retrospective analysis at the university children's hospital in the Slovak Republic. *Clin Toxicol (Phila)* 2009;47:556–561.
- 12 Hingson RW, Heeren T, Winter MR: Age at drinking onset and alcohol dependence: age at onset, duration, and severity. *Arch Pediatr Adolesc Med* 2006;160:739–746.
- 13 Hingson R, Heeren T, Zakocs R, Winter M, et al: Age of first intoxication, heavy drinking, driving after drinking and risk of unintentional injury among U.S. college students. *J Stud Alcohol* 2003;64:23–31.

- 14 Sindelar HA, Barnett NP, Spirito A: Adolescent alcohol use and injury. A summary and critical review of the literature. *Minerva Pediatr* 2004;56:291–309.
- 15 Miller JW, Naimi TS, Brewer RD, Jones SE: Binge drinking and associated health risk behaviors among high school students. *Pediatrics* 2007;119:76–85.
- 16 Wechsler H, Davenport A, Dowdall G, Moeykens B, Castillo S: Health and behavioral consequences of binge drinking in college. A national survey of students at 140 campuses. *JAMA* 1994;272:1672–1677.
- 17 Heffernan T, Clark R, Bartholomew J, Ling J, Stephens R: Does binge drinking in teenagers affect their everyday prospective memory? *Drug Alcohol Depend* 2010;109:73–78.
- 18 McQueeney T, Schweinsburg BC, Schweinsburg AD, Jacobus J, Bava S, Frank LR, Tapert SF: Altered white matter integrity in adolescent binge drinkers. *Alcohol Clin Exp Res* 2009;33:1278–1285.
- 19 Viner RM, Taylor B: Adult outcomes of binge drinking in adolescence: findings from a UK national birth cohort. *J Epidemiol Community Health* 2007;61:902–907.
- 20 Grant BF, Stinson FS, Harford TC: Age at onset of alcohol use and DSM-IV alcohol abuse and dependence: a 12-year follow-up. *J Subst Abuse* 2001;13:493–504.
- 21 Project-halt, 2014. http://www.halt-projekt.de/images/stories/pdf/2014_01_24_standorte_deutschland_januar_2014 (accessed February 4, 2014).
- 22 Nilsen P, Baird J, Mello MJ, Nirenberg T, Woolard R, Bendtsen P, Longabaugh R: A systematic review of emergency care brief alcohol interventions for injury patients. *J Subst Abuse Treat* 2008;35:184–201.
- 23 D'Onofrio G, Degutis LC: Preventive care in the emergency department: screening and brief intervention for alcohol problems in the emergency department: a systematic review. *Acad Emerg Med* 2002;9:627–638.
- 24 Havard A, Shakeshaft A, Sanson-Fisher R: Systematic review and meta-analyses of strategies targeting alcohol problems in emergency departments: interventions reduce alcohol-related injuries. *Addiction* 2008;103:368–376; discussion 377–378.
- 25 Wachtel T, Staniford M: The effectiveness of brief interventions in the clinical setting in reducing alcohol misuse and binge drinking in adolescents: a critical review of the literature. *J Clin Nurs* 2010;19:605–620.
- 26 Yuma-Guerrero PJ, Lawson KA, Velasquez MM, von Sternberg K, Maxson T, Garcia N: Screening, brief intervention, and referral for alcohol use in adolescents: a systematic review. *Pediatrics* 2012;130:115–122.
- 27 Ahmed M, Mackway-Jones K: Towards evidence based emergency medicine: best BETs from the Manchester Royal Infirmary. Is ED-based brief intervention worthwhile in children and adolescents presenting with alcohol-related events? *Emerg Med J* 2007;24:125–128.
- 28 Walton MA, Goldstein AL, Chermack ST, McCammon RJ, Cunningham RM, Barry KL, Blow FC: Brief alcohol intervention in the emergency department: moderators of effectiveness. *J Stud Alcohol Drugs* 2008;69:550–560.
- 29 Longabaugh R, Minugh PA, Nirenberg TD, Clifford PR, Becker B, Woolard R: Injury as a motivator to reduce drinking. *Acad Emerg Med* 1995;2:817–825.
- 30 Lawson PJ, Flocke SA: Teachable moments for health behavior change: a concept analysis. *Patient Educ Couns* 2009;76:25–30.
- 31 Spirito A, Monti PM, Barnett NP, Colby SM, Sindelar H, Rohsenow DJ, Lewander W, Myers M: A randomized clinical trial of a brief motivational intervention for alcohol-positive adolescents treated in an emergency department. *J Pediatr* 2004;145:396–402.
- 32 Monti PM, Colby SM, Barnett NP, Spirito A, Rohsenow DJ, Myers M, Woolard R, Lewander W: Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital emergency department. *J Consult Clin Psychol* 1999;67:989–994.
- 33 Tait RJ, Hulse GK, Robertson SI, Sprivilis PC: Emergency department-based intervention with adolescent substance users: 12-month outcomes. *Drug Alcohol Depend* 2005;79:359–363.
- 34 Newton AS, Dong K, Mabood N, Ata N, Ali S, Gokiort R, Vandermeer B, Tjosvold L, Hartling L, Wild TC: Brief emergency department interventions for youth who use alcohol and other drugs: a systematic review. *Pediatr Emerg Care* 2013;29:673–684.
- 35 Woolard R, Cherpitel C, Kathleen T: Brief Intervention for emergency department patients with alcohol misuse: implications for current practice. *Alcohol Treat Q* 2011;29:146–157.
- 36 Athanasious T, Darzi A: Evidence synthesis in healthcare: a practical handbook for clinicians. London, Springer, 2011.
- 37 Khangura S, Konnyu K, Cushman R, Grimshaw J, Moher D: Evidence summaries: the evolution of a rapid review approach. *Systematic Reviews*, 2012. <http://systematicreviewsjournal.com/content/1/1/10> (accessed June 15, 2014).
- 38 Glasgow RE, Vogt TM, Boles SM: Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *Am J Public Health* 1999;89:1322–1327.
- 39 Moher D, Liberati A, Tetzlaff J, Altman DG; PRISMA Group: Preferred reporting items for systematic reviews and meta-analysis: the PRISMA statement. *Open Med* 2009;3:123–130.
- 40 Arnett JJ: Emerging adulthood: what is it, and what is it good for? *Child Dev Perspect* 2007;1:68–73.
- 41 Cochrane Effective Practice and Organisation of Care Group (EPOC): The Data Collection Checklist. Ottawa, 2002. <https://epoc.cochrane.org/sites/epoc.cochrane.org/files/uploads/datacollectionchecklist.pdf> (accessed March 3, 2012).
- 42 Higgins JPT, Green S: *Cochrane Handbook for Systematic Reviews of Interventions* Version 5.1.0 (updated March 2011). The Cochrane Collaboration, 2011. <http://www.cochrane-handbook.org> (accessed March 5, 2012).
- 43 Wurdak M, Wolstein J: Trinkmotive von Jugendlichen und deren Bedeutung für eine zielgruppenspezifische Kurzintervention. *Sucht* 2012;58:44.
- 44 Wurdak M, Wolstein J: Motivbasierte Intervention am Krankenbett im Rahmen des Projektes 'HaLT – Hart am Limit'. Abschlussbericht an das Bundesministerium für Gesundheit, 2012. http://www.drogenbeauftragte.de/fileadmin/dateien-dba/DrogenundSucht/Alkohol/Downloads/Abschlussbericht_MotivbasierteInterventionFin.pdf (accessed January 18, 2013).
- 45 Tait RJ, Hulse GK, Robertson SI: Effectiveness of a brief-intervention and continuity of care in enhancing attendance for treatment by adolescent substance users. *Drug Alcohol Depend* 2004;74:289–296.
- 46 Segatto ML, Andreoni S, de Souza e Silva R, Diehl A, Pinsky I: Brief motivational interview and educational brochure in emergency room settings for adolescents and young adults with alcohol-related problems: a randomized single-blind clinical trial. *Rev Bras Psiquiatr* 2011;33:225–233.
- 47 Monti PM, Barnett NP, Colby SM, Gwaltney CJ, Spirito A, Rohsenow DJ, Woolard R: Motivational interviewing versus feedback only in emergency care for young adult problem drinking. *Addiction* 2007;102:1234–1243.
- 48 Spirito A, Sindelar-Manning H, Colby SM, Barnett NP, Lewander W, Rohsenow DJ, Monti PM: Individual and family motivational interventions for alcohol-positive adolescents treated in an emergency department: results of a randomized clinical trial. *Arch Pediatr Adolesc Med* 2011;165:269–274.
- 49 Miller S, Rollnick WR: *Preparing People for Change*. New York, The Guilford Press, 2002.
- 50 Müller S, Pabst A, Kronthaler F, Grubl A, Kraus L, Burdach S, Tretter F: [Acute alcohol intoxication in adolescents: preliminary results of a pilot project in Munich]. *Dtsch med Wochenschr* 2009;134:1101–1105.
- 51 Reis O, Papke M, Haessler F: Ergebnisse eines projektes zur kombinierten prävention jugendlichen rauschtrinkens [Evaluation of a project for the prevention of adolescent binge-drinking]. *Sucht* 2009;55:347–356.
- 52 Prognos: Wissenschaftliche Begleitung des Bundesmodellprogramms 'HaLT – Hart am Limit', 2008. http://www.halt-coburg.de/files/halt-projekt_endbericht.pdf (accessed December 5, 2013).
- 53 Delphi: Evaluation des 'NachHaLT'-Projektes in Berlin – Ergebnisbericht. Evaluation of the project 'NachHaLT' in Berlin – final report, 2010. http://www.halt-berlin.de/tl_files/nachhalt/bilder/PDF/NachHaLT_Evaluation_Ergebnisbericht_delphi_Nov2010.pdf (accessed February 3, 2014).

- 54 Fenzl T, Mayring P, Drobesh-Binter B, Moshitz C, Gschwendner A: Grenzwert: Praktische Erfahrungen zur Prävention von riskantem Alkoholkonsum bei Jugendlichen in Kärnten [Bordeline: Practical experiences in the prevention of risky alcohol consumption in adolescents in Carinthia]. Unpublished manuscript 1–21.
- 55 Stolle M, Sack PM, Broening S, Baldus C, Thomasius R: Brief Intervention in alcohol intoxicated adolescent – a follow-up study in an access-to-care sample. *J Alcoholism Drug Depend* 2013;1:106.
- 56 Reinier de Graaf. Jeugd en Alcohol, 2015. <https://www.reinierdegraaf.nl/kids/ouderinformatie/kinderpoliklinieken/jeugd-en-alcohol/> (accessed May 6, 2015).
- 57 De Visser M, van der Lely N, van Zanten E: Alcohol intoxication and risk factors in adolescents. *Addict Sci Clin Pract* 2013;8(suppl 1):A80.
- 58 Maria Ungdom, 2015. <http://mariaungdom.se/> (accessed May 11, 2015).
- 59 Colby SM, Monti PM, O’Leary Tevyaw T, Barnett NP, Spirito A, Rohsenow DJ, Riggs S, Lewander W: Brief motivational intervention for adolescent smokers in medical settings. *Addict Behav* 2005;30:865–874.
- 60 Brown RA, Strong DR, Abrantes AM, Myers MG, Ramsey SE, Kahler CW: Effects on substance use outcomes in adolescents receiving motivational interviewing for smoking cessation during psychiatric hospitalisation. *Addict Behav* 2009;34:887–891.
- 61 Cunningham RM, Chermack ST, Zimmerman MA, Shope JT, Bingham CR, Blow FC, Walton MA: Brief motivational interviewing intervention for peer violence and alcohol use in teens: one-year follow-up. *Pediatrics* 2012; 129:1083–1090.
- 62 Mallett KA, Lee CM, Neighbors C, Larimer ME, Turrissi R: Do we learn from our mistakes? An examination of the impact of negative alcohol-related consequences on college students’ drinking patterns and perceptions. *J Stud Alcohol* 2006;67:269–276.
- 63 Heather N: Interpreting null findings from trials of alcohol brief interventions. *Front Psychiatry* 2014;5:85.
- 64 Jenkins RJ, McAlaney J, McCambridge J: Change over time in alcohol consumption in control groups in brief intervention studies: systematic review and meta-regression study. *Drug Alcohol Depend* 2009;100:107–114.
- 65 Boudreaux E, Bock B, O’Hea E: When an event sparks behavior change: an introduction to the sentinel event method of dynamic model building and its application to emergency medicine. *Acad Emerg Med* 2012;9:329–335.
- 66 Saitz R, Palfai TP, Cheng DM, Horton NJ, Dukes K, Kraemer KL, Roberts MS, Guerriero RT, Samet JH: Some medical inpatients with unhealthy alcohol use may benefit from brief intervention. *J Stud Alcohol Drugs* 2009;70: 426–435.
- 67 Carey KB, Scott-Sheldon LA, Carey MP, DeMartini KS: Individual-level interventions to reduce college student drinking: a meta-analytic review. *Addict Behav* 2007;32:2469–2494.
- 68 Moreira MT, Smith LA, Foxcroft D: Social norms interventions to reduce alcohol misuse in University or College students. *Cochrane DB Syst Rev* 2009;3:1–97.
- 69 Reboussin BA, Anthony JC: Latent class marginal regression models for modelling youthful drug involvement and its suspected influences. *Stat Med* 2001;20:623–639.
- 70 Kraus L, Hannemann TV, Pabst A, Kronthaler F, Grübl A, Stürmer M, Wolstein J: Stationäre Behandlung von jugendlichen mit akuter alkoholintoxikation: die spitze des eisbergs? Inpatient treatment of adolescents with acute alcohol intoxication: the tip of the iceberg? *Gesundheitswesen*, 2012. <https://www.thieme-connect.com/ejournals/pdf/10.1055/s-0032-1321755.pdf> (accessed June 3, 2014).
- 71 Thush C, Wiers RW, Moerbeek M, Ames SL, Grenard JL, Sussman S, Stacy AW: Influence of motivational interviewing on explicit and implicit alcohol-related cognition and alcohol use in at-risk adolescents. *Psychol Addict Behav* 2009;23:146–151.
- 72 Härter M, Kentgens M, Brandes A, Bock T, Dirmajer J, Erzberger M, Furstenberg W, Hillebrandt B, Karow A, von Dem Knesebeck O, König HH, Lowe B, Meyer HJ, Romer G, Rouhiainen T, Scherer M, Thomasius R, Watzke B, Wegscheider K, Lambert M: Rationale and content of psychenet: the Hamburg network for mental health. *Eur Arch Psychiatry Clin Neurosci* 2012;262(suppl 2):S57–S63.

Publication III. Riskanter Alkoholkonsum bei Jugendlichen. Manual zur Durchführung einer motivierenden Kurzintervention

Reference. Diestelkamp, S. & Thomasius, R. (2017). Riskanter Alkoholkonsum bei Jugendlichen. Manual zur Durchführung einer motivierenden Kurzintervention [At-risk Alcohol Use in Adolescents. Manual for the Delivery of a Brief Motivational Intervention]. Berlin, Heidelberg: Springer.

Format. published book

Note: Due to copyright issues publication no III is published in a shortened version (pages 1 – 20 only) in the published version of this dissertation.



Silke Diestelkamp · Rainer Thomasius

Riskanter Alkoholkonsum bei Jugendlichen

Manual zur Durchführung
einer motivierenden
Kurzintervention

 Springer

Riskanter Alkoholkonsum bei Jugendlichen

Silke Diestelkamp
Rainer Thomasius

Riskanter Alkoholkonsum bei Jugendlichen

Manual zur Durchführung einer motivierenden Kurzintervention

Mit 30 Abbildungen

Unter Mitarbeit von Katrin Lammers und Udo J. Küstner

Silke Diestelkamp

Universitätsklinikum Hamburg-Eppendorf
Deutsches Zentrum für Suchtfragen des
Kindes- und Jugendalters
Hamburg
Deutschland

Rainer Thomasius

Universitätsklinikum Hamburg-Eppendorf
Deutsches Zentrum für Suchtfragen des
Kindes- und Jugendalters
Hamburg
Deutschland

ISBN 978-3-662-49314-4 ISBN 978-3-662-49315-1 (eBook)
DOI 10.1007/978-3-662-49315-1

Die Deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über <http://dnb.d-nb.de> abrufbar.

© Springer-Verlag Berlin Heidelberg 2017

Das Werk einschließlich aller seiner Teile ist urheberrechtlich geschützt. Jede Verwertung, die nicht ausdrücklich vom Urheberrechtsgesetz zugelassen ist, bedarf der vorherigen Zustimmung des Verlags. Das gilt insbesondere für Vervielfältigungen, Bearbeitungen, Übersetzungen, Mikroverfilmungen und die Speicherung und Verarbeitung in elektronischen Systemen.

Die Wiedergabe von Gebrauchsnamen, Handelsnamen, Warenbezeichnungen usw. in diesem Werk berechtigt auch ohne besondere Kennzeichnung nicht zu der Annahme, dass solche Namen im Sinne der Warenzeichen- und Markenschutz-Gesetzgebung als frei zu betrachten wären und daher von jedermann benutzt werden dürften.

Der Verlag, die Autoren und die Herausgeber gehen davon aus, dass die Angaben und Informationen in diesem Werk zum Zeitpunkt der Veröffentlichung vollständig und korrekt sind. Weder der Verlag, noch die Autoren oder die Herausgeber übernehmen, ausdrücklich oder implizit, Gewähr für den Inhalt des Werkes, etwaige Fehler oder Äußerungen.

Umschlaggestaltung: deblik Berlin
Einbandabbildung: © surasaki/Fotolia

Gedruckt auf säurefreiem und chlorfrei gebleichtem Papier

Springer ist Teil von Springer Nature
Die eingetragene Gesellschaft ist Springer-Verlag GmbH Germany
Die Anschrift der Gesellschaft ist: Heidelberger Platz 3, 14197 Berlin, Germany

Geleitwort Sven Kammerahl

Das Projekt HaLT – Hart am LimiT wurde von der „Villa Schöpflin“, einer stiftungsfinanzierten suchtpräventiven Einrichtung in Lörrach, 2002 entwickelt. Aufgrund des stetigen Anstiegs der Fallzahlen alkoholintoxikierter Kinder und Jugendlicher förderte das Bundesministerium für Gesundheit von 2003 bis 2004 eine Pilotphase in Lörrach. Nach dem erfolgreichen Start wurde das Projekt 2007 als Bundesmodellprojekt an 10 weiteren Standorten in 9 Bundesländern gefördert. Mittlerweile gibt es HaLT – Hart am LimiT in 14 Bundesländern an insgesamt 155 Standorten. Die Initiatoren von HaLT – Hart am LimiT haben immer einen ganzheitlichen Präventionsansatz mit proaktiven und reaktiven Bausteinen vertreten. HaLT – Hart am LimiT sollte sich nicht lediglich auf die alkoholintoxikierten Kinder und Jugendlichen fokussieren, sondern die universelle und selektive Prävention konzeptionell mit aufnehmen. Hamburg hatte zu dem Zeitpunkt, als wir uns für das Projekt entschieden, schon eine strukturell ausgeprägte Alkoholprävention, sodass lediglich der reaktive Baustein von HaLT – Hart am LimiT in der Vielzahl von Angeboten fehlte. Anfänglich wurden die Interventionen am Krankenbett von Mitarbeiterinnen und Mitarbeitern einer Suchtberatungsstelle durchgeführt. Die Finanzierung erfolgte damals ausschließlich über Zuwendungsmittel. Seit 2011 können wir, dank einer gemeinsamen Rahmenvereinbarung mit den gesetzlichen Krankenkassen und der damit verbundenen finanziellen Unterstützung, das Projekt an 6 Hamburger Krankenhäusern mit geschulten Fachkräften an den Wochentagen (Freitag bis Sonntag) durchführen. Aktuell gehen 8 ausgebildete freiberufliche Fachkräfte in die Krankenhäuser und führen unter Begleitung der überregionalen Suchtberatungsstelle für Jugendliche Kö16a, die Intervention am Krankenbett durch. Eine randomisiert-kontrollierte Evaluation der Wirksamkeit dieser motivierenden Kurzintervention am Krankenbett stand bislang jedoch noch aus. Vor diesem Hintergrund entschieden sich die Hamburger Beteiligten, das HaLT-Hamburg-Manual und die zugehörige Schulung zu entwickeln. Im Rahmen des Forschungsverbundes psychenet warb das Deutsche Zentrum für Suchtfragen des Kindes- und Jugendalters (DZSKJ) Forschungsmittel des Bundesministeriums für Bildung und Forschung (BMBF) ein und setzte diese für die Umsetzung einer Wirksamkeitsstudie von HaLT-Hamburg und die Erstellung des vorliegenden Manuals ein. Mit dem wissenschaftlichen Sachverstand des DZSKJ, der Praxiserfahrung von Katrin Lammers (Kö16) und der von Udo Küstner (Drogen- und Alkoholambulanz für Jugendliche, junge Erwachsene und deren Familien am Universitätsklinikum Hamburg-Eppendorf) konnte dieses umfassende Manual zur Kurzintervention entwickelt werden, mit dem wir bundesweit zur Weiterentwicklung der motivierenden Kurzintervention am Krankenbett beitragen können. Es ist ein gutes Beispiel für die interdisziplinäre Zusammenarbeit und für einen gelungenen Wissenschaft-Praxis-Transfer. Wir danken dem UKE, Herrn Professor Thomasius, Frau Diestelkamp, Herrn Arnaud und Herrn Küstner.

Sven Kammerahl

Behörde für Gesundheit und Verbraucherschutz der Freien und Hansestadt Hamburg
Fachabteilung Drogen und Sucht

Geleitwort Susanne Schmitt

Das Präventionsprogramm HaLT – Hart am LimiT steht deutschlandweit für qualitätsgesicherte Prävention zur Verhinderung von jugendlichem Alkoholmissbrauch. Die Einzigartigkeit und der Erfolg dieses Programmes, das im Jahr 2002 von der Villa Schöpflin gGmbH – Zentrum für Suchtprävention in Lörrach entwickelt wurde, liegt in der Kombination aus verhaltens- und verhältnispräventiven Maßnahmen. In den vergangenen Jahren hat sich mit diesem Erfolgsmodell ein Netzwerk aus 155 Standorten in 14 Bundesländern entwickelt.

Die verhaltenspräventiven Maßnahmen bilden den „reaktiven Baustein“ von HaLT. Kern dieses Bereichs ist die Ansprache von Jugendlichen, die aufgrund einer Alkoholintoxikation ins Krankenhaus eingeliefert wurden. Auf der Grundlage der motivierenden Gesprächsführung erhalten sie und ihre Eltern ein individuell abgestimmtes Hilfsangebot. Ergänzend zu diesem indizierten Präventionsangebot steht eine kommunal verankerte Präventionsstrategie, der „proaktive Baustein“. Durch die Einbindung regionaler Akteure und Akteurinnen aus verschiedenen Professionen soll schädlicher Alkoholkonsum unter Jugendlichen verhindert werden. Die konsequente Einhaltung des Jugendschutzes spielt hier eine zentrale Rolle.

Das HaLT-Programm wird im Rahmen der Qualitätssicherung kontinuierlich wissenschaftlich begleitet und weiterentwickelt. Dies wird seit November 2014 durch das eigens gegründete und von der Schöpflin Stiftung finanzierte HaLT Service Center gewährleistet. Das Service Center koordiniert bundesweit zentrale Aktivitäten im HaLT-Netzwerk, garantiert regelmäßige Fachkräfteschulungen, stellt dem Netzwerk aktuelle Materialien und Informationen zur Verfügung und vertritt das Programm auf politischer Ebene.

HaLT – Hart am LimiT wird in Hamburg seit dem Jahr 2007 umgesetzt und ist einer der größten Standorte bundesweit. In der Umsetzung beider Bausteine hat der Standort Hamburg bundesweit Vorbildcharakter. Im reaktiven Bereich entwickelte sich eine hervorragende Zusammenarbeit mit 6 Hamburger Kliniken sowie mit dem Deutschen Zentrum für Suchtfragen im Kindes- und Jugendalter. Diese Kooperationen ermöglichten die wissenschaftliche Begleitung des Hamburger Standortes in Form einer Studie, die diesem Manual zugrunde liegt. Gegenstand der Studie waren Wirksamkeit und Umsetzbarkeit der bisherigen HaLT-Kurzintervention im Krankenhaus. Auf dieser empirischen Basis ist nun dieses valide Hilfsmittel zur Durchführung der Kurzintervention für Jugendliche mit riskantem Alkoholkonsum entstanden. Als Ergänzung zum HaLT-Handbuch der Villa Schöpflin gGmbH kann das Hamburger Manual allen HaLT-Präventionsfachkräften im Bundesnetzwerk empfohlen werden.

Susanne Schmitt

HaLT Service Center der Schöpflin Stiftung

Vorwort der Autoren

Riskanter Alkoholkonsum im Jugendalter ist weit verbreitet und für viele Jugendliche ein passageres Phänomen, aus dem sie mit zunehmendem Alter „von allein“ herauswachsen. Aber darf man riskanten Konsum in diesem Alter daher bagatellisieren? Eine Begegnung im Winter 2010/2011 möchten wir hierzu beispielhaft schildern. Wir saßen mit Prof. Püschel, dem Direktor der Rechtsmedizin am Universitätsklinikum Hamburg-Eppendorf, zusammen, um eine Projektidee zu besprechen. Als wir von der bald beginnenden HaLT-Hamburg-Studie berichteten, erzählte Prof. Püschel von zwei jungen Mädchen, die er kürzlich habe obduzieren müssen. Beide Mädchen waren – unabhängig voneinander – nachts vor Diskotheken erfroren, weil sie stark alkoholisiert im Schnee eingeschlafen bzw. in einen Graben gerutscht waren. Sie waren leicht bekleidet ins Freie gegangen, weil ihnen die Warteschlangen vor den Toiletten zu lang waren. Exzessiver Alkoholkonsum kann, auch bei seltenen Trinkgelegenheiten, schwerwiegende Folgen haben.

Deshalb ist das vom Suchtpräventionszentrum Villa Schöpflin entwickelte Präventionsprogramm HaLT – Hart am LimiT so wichtig, da es sich nicht nur an die kleine Gruppe von Jugendlichen mit einer möglichen Suchtgefährdung richtet, sondern auch an die große Gruppe von Jugendlichen, die sich und andere durch episodisch exzessiven Alkoholkonsum potenziell in Gefahr bringen. Der „reaktive Baustein“ dieses Projektes richtet sich an Kinder und Jugendliche, die aufgrund einer akuten Alkoholintoxikation in einer Klinik behandelt werden, und hat das Ziel, diese besonders gefährdeten Kinder und Jugendlichen in einem Gespräch zu einem risikoarmen Konsum bzw. zur Abstinenz zu motivieren.

Die Wirksamkeit dieses Ansatzes wurde nun im Rahmen der randomisiert-kontrollierten HaLT-Hamburg-Studie untersucht. Die Studie war Teil des Verbundprojektes psychenet – Hamburger Netzwerk für psychische Gesundheit, das aus mehr als 80 Hamburger wissenschaftlichen und medizinischen Einrichtungen, Beratungsstellen, dem Senat und der Handelskammer der Freien und Hansestadt Hamburg, Krankenkassen, Unternehmen sowie Betroffenen und Angehörigenverbänden besteht. Ziel des von 2011 bis 2014 vom Bundesministerium für Bildung und Forschung (BMBF) geförderten Projektes war die Entwicklung und Evaluation von wegweisenden Versorgungsmodellen. In 11 wissenschaftlich begleiteten Teilprojekten untersuchte psychenet, wie die Versorgung psychisch kranker Menschen verbessert werden kann und welche Möglichkeiten der Vorbeugung sowie zum besseren Umgang mit Erkrankungen wirkungsvoll sind. Im Rahmen des HaLT-Hamburg-Forschungsprojektes wurde das vorliegende Manual zur Durchführung einer motivierenden Kurzintervention für riskant Alkohol konsumierende Kinder und Jugendliche entwickelt.

Den vielen beteiligten Personen möchten wir an dieser Stelle herzlichen Dank aussprechen. Besonderer Dank gilt all den Personen, die die Durchführung dieses aufwendigen Forschungsvorhabens erst möglich gemacht haben. Hierzu zählen ganz besonders die HaLT-Hamburg-Beraterinnen und -Berater Klaus Wilkens, Franka Metzner, Michael Knaack, Leona Jakubowski, Martina Teske und Corinna Liesk, die bereit waren, zu ungewöhnlichen Arbeitszeiten ihre Einsätze durchzuführen, und mit ausgesprochenem Engagement, Interesse und Professionalität die Gespräche am Krankenbett geführt haben. Außerdem wäre natürlich die Durchführung der Studie nicht möglich gewesen ohne unser Evaluationsteam, welches ebenfalls früh morgens

an den Wochenenden die Jugendlichen in den Kliniken aufsuchte, um sie zu befragen, und das unter der Woche neben einer ganzen Reihe von verschiedenen Arbeiten vor allem mit viel Einsatz und Ausdauer die telefonischen Nachbefragungen durchführte und die erhobenen Daten digitalisierte. An dieser Stelle möchten wir daher auch einen großen Dank an Sabrina Kunze-Klempert, Victoria Winter, Janina Windsor, Kristina Wille, Elisabeth Zahn, Tharanya Seeralan, Lina Dening, Katharina Kröger, Alexandra Martin und Ida Roscher aussprechen.

Nicht unerwähnt sollen an dieser Stelle auch die teilnehmenden Kliniken bleiben, ohne deren Kooperation und Unterstützung dieses Projekt ebenfalls nicht hätte stattfinden können. Wir möchten uns daher ganz herzlich bei Frau Dr. Barbara Hogan und Frau Dr. Ulrike Güssow (Asklepios Klinik Altona), Herrn Prof. Dr. Norbert Veelken (Asklepios Klinik Nord Heidberg), Frau Dr. Caroline Schmitt (Helios Mariahilf Klinik Harburg), Herrn Prof. Dr. Philippe Stock (Altonaer Kinderkrankenhaus), Frau Prof. Dr. Ania Muntau (Universitätsklinikum Hamburg-Eppendorf), Herrn Prof. Dr. Peter Höger (Katholisches Kinderkrankenhaus Wilhelmstift) und dem beteiligten Klinikpersonal in den 6 Kliniken für die hervorragende Zusammenarbeit bedanken. An dieser Stelle möchten wir auch Herrn Dr. Klaus Beelmann, Leiter der Ärztekammer Hamburg, für seine Unterstützung des Projektes danken.

Unser besonderer Dank gilt auch unserem Kooperationspartner, der Behörde für Gesundheit und Verbraucherschutz der Stadt Hamburg (BGV), vertreten durch Frau Dr. Sigrun Bever, Frau Monika Püschl, Herrn Sven Kammerahl und Herrn Dietrich Hellge-Antoni, für die konstruktive Zusammenarbeit, ohne die die Durchführung dieses Forschungsvorhabens ebenfalls nicht möglich gewesen wäre. Besonders erwähnen und danken möchten wir außerdem Frau Katrin Lammers (Suchtberatung für Kinder und Jugendliche Kö16a) und Herrn Udo Küstner (Drogen- und Alkoholambulanz für Jugendliche, junge Erwachsene und deren Familien am Universitätsklinikum Hamburg-Eppendorf) für die vielen praktischen Anregungen und die gute Zusammenarbeit in der Entwicklung des Manuals, der Entwicklung und Durchführung der HaLT-Hamburg-Schulung und der Supervisionen sowie Frau Katrin Lammers für die unermüdliche Einsatzplanung für die Berater während der Studienphase.

Aus Gründen der Lesbarkeit wird im gesamten Manual das Maskulinum verwendet. Es sind jedoch stets beide Geschlechter gleichermaßen angesprochen.

Wir wünschen den Lesern dieses Manuals eine inspirierende und hilfreiche Lektüre und viel Erfolg bei der Durchführung der Intervention.

Silke Diestelkamp

Prof. Dr. Rainer Thomasius

Deutsches Zentrum für Suchtfragen des Kindes- und Jugendalters

Inhaltsverzeichnis

1	Einleitung	1
2	Theoretischer Hintergrund	3
2.1	Riskanter Alkoholkonsum bei Jugendlichen	5
2.1.1	Konsum und Verbreitung	5
2.1.2	Minderjährige mit akuter Alkoholintoxikation	5
2.2	Risiken und Folgen	7
2.3	Konsummotive und Wirkserwartungen	8
2.4	Modelle jugendlichen Alkoholkonsums	9
2.4.1	Motivational Model of Alcohol Use	10
2.4.2	Social Reaction Model of Adolescent Health Risk	12
2.4.3	Das duale Prozessmodell jugendlichen Risikoverhaltens	13
2.5	Risiko- und Schutzfaktoren für eine spätere Schädigung durch Alkoholkonsum	14
2.6	Erkennen riskanten Alkoholkonsums	15
2.7	Wirksamkeit von Motivierenden Kurzinterventionen	17
2.8	Motivierende Gesprächsführung nach Miller und Rollnick	18
2.8.1	Die therapeutische Grundhaltung im MI	20
2.8.2	Das 4-Prozesse-Modell der motivierenden Gesprächsführung	21
2.8.3	OARS	23
2.8.4	Umgang mit Sustain Talk und Dissonanz in der Berater- Klient-Beziehung	24
2.8.5	Umgang mit Jugendlichen ohne Ambivalenz	26
2.9	Das transtheoretische Modell der Veränderung nach Prochaska und DiClemente	28
2.10	Phasen der Veränderungsbereitschaft und therapeutisches Verhalten	30
2.11	Die Komponenten der motivierenden Kurzintervention nach Spirito et al. (2004)	30
2.12	Abgrenzungen der motivierenden Gesprächsführung zu anderen therapeutischen Ansätzen	30
3	Die HaLT-Hamburg-Studie	33
3.1	Hintergrund	34
3.2	Entwicklung der HaLT-Hamburg-Intervention	34
3.3	Studiendesign	35
3.3.1	Messinstrumente	36
3.3.2	Statistische Analysen	37
3.4	Evaluationsergebnisse	37
3.4.1	Wen erreicht HaLT-Hamburg? Beschreibung der Stichprobe	37
3.4.2	Wirksamkeit der motivierenden Kurzintervention am Krankenbett	39
3.4.3	Positive Wertschätzung durch den Berater fördert die Veränderungsmotivation	41
3.4.4	Prozessevaluation: Das Projekt HaLT-Hamburg aus Sicht der Berater	41
3.4.5	Das Projekt HaLT-Hamburg aus Sicht des Krankenhauspersonals und der Chefarzte	41
3.4.6	Einschätzung des therapeutischen Beziehungsverhaltens aus Sicht der Studienteilnehmer	42
3.5	Fazit	43

4	Praxis	45
4.1	Praktische Durchführung der HaLT-Hamburg-Intervention	46
4.1.1	Zielgruppe	46
4.1.2	Qualifikation der Berater	46
4.1.3	Rahmenbedingungen	46
4.1.4	Ablauf	47
4.1.5	Vorbereitungen	48
4.2	Ziele der motivierenden Kurzintervention für Jugendliche	48
4.3	Ziele der Elternintervention	49
4.4	Durchführung der motivierenden Kurzintervention	49
4.4.1	Begrüßung und Vorstellung des Projektes	49
4.4.2	Motivierende Kurzintervention Jugendliche	52
4.5	Elterngespräch	62
4.5.1	Erkennen	63
4.5.2	Verstehen	64
4.5.3	Unterstützen	65
4.6	Abschlussgespräch	66
4.7	HaLT-Hamburg-Gesprächsdokumentation	67
5	Materialien und weiterführende Literatur	69
5.1	Materialien für die Durchführung der Intervention	70
5.2	Recommended Reading	98
	Serviceteil	99
	Literatur	100
	Stichwortverzeichnis	104

Autorenverzeichnis



Dipl.-Psych. Silke Diestelkamp, Jahrgang 1978, studierte Psychologie an der Universität Trier und arbeitete anschließend mit verhaltensauffälligen Jugendlichen in berufsvorbereitenden Maßnahmen. Seit 2010 ist sie wissenschaftliche Mitarbeiterin im Projekt „Gesundheitsnetz Alkohol im Jugendalter – Verbesserung des Behandlungszugangs für riskant Alkohol konsumierende Jugendliche“ am Deutschen Zentrum für Suchtfragen des Kindes- und Jugendalters (DZSKJ) am Universitätsklinikum Hamburg-Eppendorf (UKE) und promoviert zurzeit zu dem Thema „Differenzielle Wirksamkeit von Kurzinterventionen zur Reduktion riskanten Alkoholkonsums bei Jugendlichen“.



Prof. Dr. med. Rainer Thomasius, Jahrgang 1957. Studium der Medizin in Hamburg. Ausbildung in Psychiatrie, Kinder- und Jugendpsychiatrie, Psychotherapie und Familientherapie. Habilitation 1994. 1999–2004 Leiter des Bereichs Persönlichkeits- und Belastungsstörungen im Zentrum für Psychosoziale Medizin am Universitätsklinikum Hamburg-Eppendorf (UKE). Seit 2005 Ärztlicher Leiter „Deutsches Zentrum für Suchtfragen des Kindes- und Jugendalters“ am UKE und Leiter des Bereichs Suchtstörungen, Klinik für Kinder- und Jugendpsychiatrie, -psychotherapie und -psychosomatik. Federführendes Mitglied der Kommission Behandlungsleitlinien der Deutschen Gesellschaft für Suchtforschung und Suchttherapie (DG-Sucht). Vorsitzender Suchtkommission der Deutschen Gesellschaft für Kinder- und Jugendpsychiatrie, Psychosomatik und Psychotherapie (DGKJP).



Dipl. Soz. Päd./Suchttherapeutin (VDR anerkannt) Katrin Lammers, Jahrgang 1979, studierte Soziale Arbeit/Sozialwesen an der Fachhochschule Kiel, arbeitet seit Studienabschluss 2007 in der Suchthilfe und schloss 2015 die Weiterbildung als Integrative Sozialtherapeutin Schwerpunkt Suchtkrankenhilfe ab. Seit 2010 ist sie Mitarbeiterin der Suchtberatung Kö 16a für Kinder, Jugendliche, junge Erwachsene und deren Angehörige der Behörde für Gesundheit und Verbraucherschutz (BGV) der Stadt Hamburg. Neben der Beratung im Einzel- oder Familiensetting ist sie für Informationsveranstaltungen für Jugendliche, Elternarbeit, die Akupunkturbehandlung nach dem NADA Protokoll, Öffentlichkeitsarbeit, Mitarbeiterfortbildungen sowie für die Projektbetreuung und Koordination des HaLT-Hamburg-Teams zuständig.



Dipl.-Psych. Udo Küstner, Jahrgang 1959, studierte Psychologie an der Johannes Gutenberg Universität Mainz. Nach dem Studium war er in verschiedenen Arbeitsfeldern der Psychiatrie, Psychotherapie und Suchterkrankungen tätig. Seit dem Jahr 2000 ist er als Psychologischer Psychotherapeut und wissenschaftlicher Mitarbeiter in der Drogen- und Alkoholambulanz für Jugendliche, junge Erwachsene und deren Familien am Universitätsklinikum Hamburg-Eppendorf beschäftigt.

Einleitung

Die HaLT-Hamburg-Kurzintervention für Kinder und Jugendliche nach akuter Alkoholintoxikation wurde im Rahmen eines vom Bundesministerium für Bildung und Forschung (BMBF) geförderten Forschungsprojektes entwickelt und in den Jahren 2011 – 2014 als Teilprojekt des Forschungsverbundes psychenet – Hamburger Netzwerk für psychische Gesundheit (Härter et al., 2012) in einer prospektiven randomisiert-kontrollierten Studie an sechs Hamburger Kliniken hinsichtlich ihrer Wirksamkeit und Umsetzbarkeit untersucht. Basierend auf dem Leitfaden und Gesprächswegweiser für Brückengespräche des Alkoholpräventionsprogramms HaLT – Hart am LimiT (Villa Schöpflin, 2009) und aktuellen Forschungsbefunden entstand in Kooperation mit der Suchtberatung für Kinder und Jugendliche Kö16a (Katrin Lammers) und der Drogen- und Alkoholambulanz für Kinder, Jugendliche und deren Familien am Universitätsklinikum Hamburg-Eppendorf (Udo Küstner) eine Intervention, die gleichsam standardisiert und transparent und damit evaluierbar und übertragbar auf andere Standorte ist, die aber auch Freiheitsgrade für die individuelle beraterische Schwerpunktsetzung lässt. Die Umsetzung der empathischen und wertschätzenden therapeutischen Grundhaltung des Motivational Interviewing (MI), wie sie später eingehender beschrieben wird, wird damit besonders berücksichtigt. Die wertvollen Rückmeldungen der HaLT-Hamburg-Beraterinnen und -Berater und der Mitarbeiter des Evaluationsteams sowie die Ergebnisse der Befragung des beteiligten Klinikpersonals fanden neben den Evaluationsergebnissen zur Wirksamkeit der Intervention Eingang in dieses Manual.

Das Manual gliedert sich in einen theoretischen Teil, der die theoretischen Grundlagen der Intervention und Hintergrundinformationen über das Forschungsprojekt beinhaltet. Es schließt sich der praktische Teil an, in dem detailliert der Ablauf der Intervention dargestellt ist. Gesprächsbeispiele, Erläuterungen zur Rationale der Vorgehensweise und Anregungen zum Umgang mit schwierigen Situationen werden aufgezeigt. Das Manual enthält darüber hinaus verschiedene „Memokarten“, die während der Intervention als Strukturierungshilfe zum Einsatz kommen. Den Abschluss des Manuals bildet der Anhang, in dem alle Materialien zusammengestellt sind, die für die Durchführung der Intervention benötigt werden.

Dieses Manual richtet sich an Sozialpädagogen, Psychologen, Pädagogen, Erziehungswissenschaftler und Ärzte, die mit Kindern und Jugendlichen mit riskantem Alkoholkonsum arbeiten. Im Speziellen richtet es sich an Fachkräfte, die mit Kindern und Jugendlichen nach akuter Alkoholintoxikation eine motivierende Kurzintervention durchführen möchten.

Theoretischer Hintergrund

- 2.1 Riskanter Alkoholkonsum bei Jugendlichen – 5**
 - 2.1.1 Konsum und Verbreitung – 5
 - 2.1.2 Minderjährige mit akuter Alkoholintoxikation – 5
- 2.2 Risiken und Folgen – 7**
- 2.3 Konsummotive und Wirkerwartungen – 8**
- 2.4 Modelle jugendlichen Alkoholkonsums – 9**
 - 2.4.1 Motivational Model of Alcohol Use – 10
 - 2.4.2 Social Reaction Model of Adolescent Health Risk – 12
 - 2.4.3 Das duale Prozessmodell jugendlichen Risikoverhaltens – 13
- 2.5 Risiko- und Schutzfaktoren für eine spätere Schädigung durch Alkoholkonsum – 14**
- 2.6 Erkennen riskanten Alkoholkonsums – 15**
- 2.7 Wirksamkeit von Motivierenden Kurzinterventionen – 17**
- 2.8 Motivierende Gesprächsführung nach Miller und Rollnick – 18**
 - 2.8.1 Die therapeutische Grundhaltung im MI – 20
 - 2.8.2 Das 4-Prozesse-Modell der motivierenden Gesprächsführung – 21
 - 2.8.3 OARS – 23
 - 2.8.4 Umgang mit Sustain Talk und Dissonanz in der Berater-Klient-Beziehung – 24
 - 2.8.5 Umgang mit Jugendlichen ohne Ambivalenz – 26
- 2.9 Das transtheoretische Modell der Veränderung nach Prochaska und DiClemente – 28**

- 2.10 **Phasen der Veränderungsbereitschaft und therapeutisches Verhalten – 30**
- 2.11 **Die Komponenten der motivierenden Kurzintervention nach Spirito et al. (2004) – 30**
- 2.12 **Abgrenzungen der motivierenden Gesprächsführung zu anderen therapeutischen Ansätzen – 30**

Im folgenden Kapitel werden relevante Hintergrundinformationen zu Alkoholkonsum im Jugendalter vorgestellt sowie die theoretischen Annahmen und die Konzeptualisierung des Motivational Interviewing dargelegt.

2.1 Riskanter Alkoholkonsum bei Jugendlichen

2.1.1 Konsum und Verbreitung

Der bundesweite Trend des regelmäßigen Alkoholkonsums der 12- bis 25-jährigen Jugendlichen ist seit den 1970er Jahren tendenziell rückläufig (Orth u. Töppich, 2015). Auch unter den minderjährigen 12- bis 17-Jährigen sinkt der Anteil der Jugendlichen, die regelmäßig, d. h. mindestens einmal pro Woche, Alkohol konsumieren, seit Beginn der Datenerhebung durch die Bundeszentrale für gesundheitliche Aufklärung im Jahr 1979 tendenziell (ebd.; [Abb. 2.1](#)).

Das Einstiegsalter für den ersten Alkoholkonsum und das Alter des ersten Alkoholrausches sind bundesweit seit dem Jahr 2004 bis zum Jahr 2014 um knapp 7 Monate gestiegen. Trotzdem existiert aber ein stabiler Prozentsatz an Jugendlichen, die episodisch exzessiv konsumieren (Orth u. Töppich, 2015). Unter episodisch exzessivem Konsum wird häufig das sog. Binge Drinking, d. h. der Konsum von 5 (4 für Mädchen) oder mehr Standardgläsern Alkohols bei einer Trinkgelegenheit, verstanden (Herring et al., 2008).

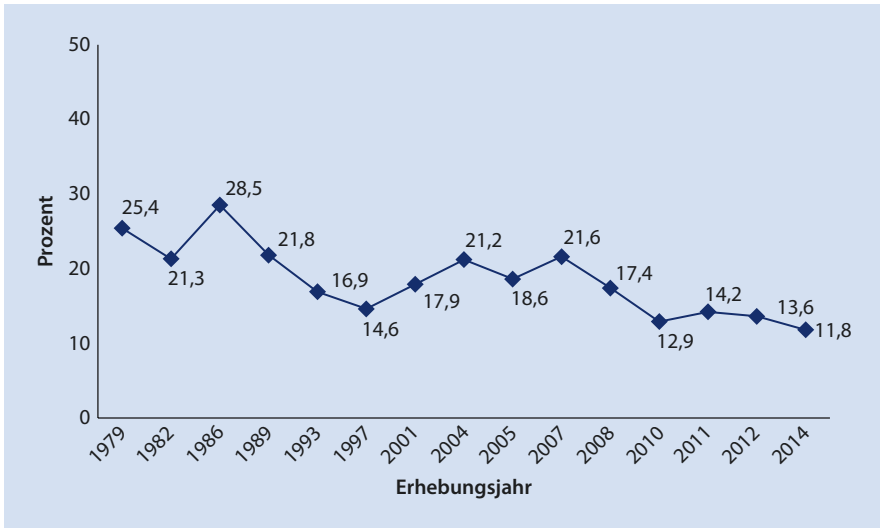
➤ **Als Rauschtrinken wird der Konsum von 5 alkoholischen Standardgetränken bei einer Trinkgelegenheit für Männer und 4 alkoholischen Standardgetränken für Frauen bezeichnet.**

Die Zahl der Jugendlichen bis zum Alter von 20 Jahren, die in Deutschland aufgrund einer akuten Alkoholintoxikation (AAI) stationär behandelt wurden, ist von 9.500 im Jahr 2000 auf 22.250 im Jahr 2014 gestiegen, was einer Steigerung um 136% entspricht (Gesundheitsberichterstattung des Bundes, 2016; [Abb. 2.2](#)). Steigende Prävalenzraten von Jugendlichen, die aufgrund einer akuten Alkoholintoxikation (Diagnose F10.0, ICD 10) notfallmedizinisch behandelt werden müssen, wurden in den letzten Jahren aus verschiedenen europäischen Ländern berichtet (Healey et al., 2014; Fandler et al., 2008; Caflisch et al., 2013; Van Hoof et al., 2010; Bitunjac et al., 2009; Loukova, 2011; Kuzelová et al., 2009).

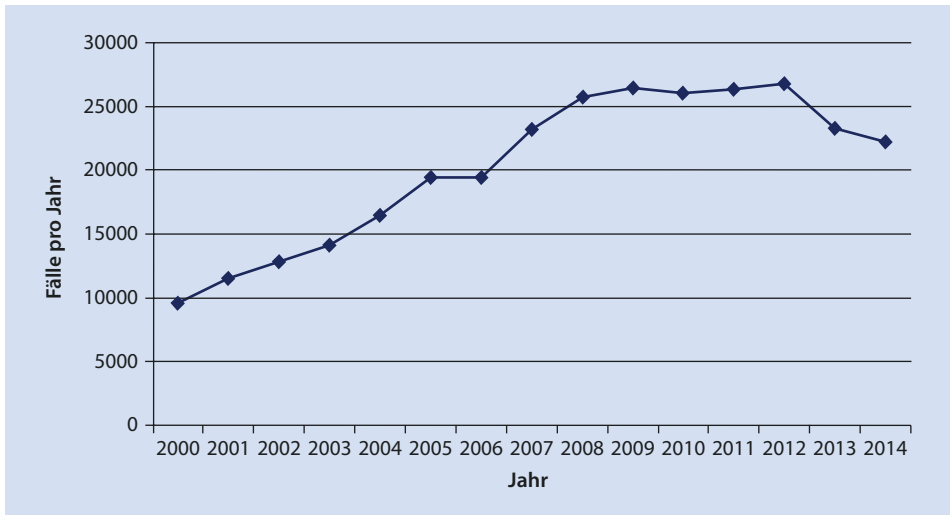
➤ **Die Zahl der unter 20-Jährigen mit akuter Alkoholintoxikation ist seit dem Jahr 2000 von ca. 9.500 auf ca. 22.000 Fälle jährlich gestiegen.**

2.1.2 Minderjährige mit akuter Alkoholintoxikation

Es ist wahrscheinlich, dass dieser Anstieg der Behandlungszahlen zum Teil auch auf eine Sensibilisierung in der Bevölkerung zurückzuführen ist, die sich darin ausdrückt, dass schon bei weniger stark intoxikierten Jugendlichen ein Krankenwagen angefordert wird. Eine Studie dazu von Wurdak et al. (2013) fand, dass in einer Gemeinde mit besonders hohen stationären Behandlungszahlen für Minderjährige mit AAI die durchschnittliche Blutalkoholkonzentration der behandelten Jugendlichen geringer und die Bereitschaft der Bevölkerung einen Krankenwagen anzufordern höher war als in einer Vergleichsgemeinde mit niedrigeren Behandlungszahlen. Dennoch ist zu beachten, dass unter den Minderjährigen, die aufgrund einer Alkoholintoxikation



■ **Abb. 2.1** Anteile der 12- bis 17-Jährigen, die mindestens einmal pro Woche Alkohol konsumieren bundesweit (Orth u. Töppich, 2015)



■ **Abb. 2.2** Entwicklung der Anzahl stationär aufgenommener unter 20-Jähriger mit Diagnose „Alkoholintoxikation“ in Krankenhäusern bundesweit (Gesundheitsberichterstattung des Bundes, 2016)

notfallmedizinisch behandelt werden müssen, im Vergleich zur Allgemeinbevölkerung ein höherer Anteil von Kindern und Jugendlichen zu beobachten ist, der riskant Substanzen konsumiert und weiteren Entwicklungsgefährdungen ausgesetzt ist. So wurden z.B. unter Kindern und Jugendlichen mit einer AAI höhere Prävalenzen von Alkoholmissbrauch, Alkoholabhängigkeit, Binge Drinking, Tabakkonsum und dem Konsum illegaler Substanzen beobachtet als in der Allgemeinbevölkerung (Groß et al., 2016a). In der HaLT-Hamburg-Stichprobe wurde ein sehr hoher Anteil (63,6%) an Kindern und Jugendlichen beobachtet, die ein positives Screeningergebnis

für riskanten Alkoholkonsum erhielten (Wartberg et al., im Druck). Eine Studie in Bayern fand, dass Minderjährige mit AAI zwar seltener tranken als Jugendliche in der Allgemeinbevölkerung (2,8 vs. 5,0 Tage in den letzten 30 Tagen), dafür jedoch größere Mengen konsumierten, wenn sie tranken (36,4 g vs. 22,3 g Reinalkohol pro Trinktag; Kraus et al., 2013). Trinkmusteranalysen zeigten, dass 21,5% der Minderjährigen mit AAI als habituell riskant Alkohol konsumierend und 16,5% als habituell hoch riskant konsumierend eingestuft werden können (Diesselkamp et al., 2015).

Darüber hinaus wurde festgestellt, dass auch die psychosoziale Belastung in dieser Zielgruppe höher ist als in der Allgemeinbevölkerung. Jugendliche, die mit einer AAI notfallmedizinisch behandelt wurden, weisen ein 6-fach erhöhtes Risiko auf, von einer schweren Entwicklungsgefährdung betroffen zu sein, wie z.B. familiärer Gewalt, Schulproblemen, Delinquenz und Gewalttäterschaft wie -opferschaft (Kuttler et al., 2016). Im Alter von Mitte zwanzig weisen junge Erwachsene, die als Minderjährige mit einer AAI im Krankenhaus behandelt wurden, deutlich höhere Prävalenz einer schweren alkoholbezogenen Störung auf (8% vs. 1% in einer Vergleichsstichprobe ohne AAI), sie konsumieren häufiger illegale Substanzen (20% vs. 10%) und berichten häufiger über delinquentes Verhalten (50% vs. 35%; Groß et al., 2016b).

➤ **Eine Alkoholintoxikation eines Minderjährigen bedeutet nicht zwingend, dass dieser gewohnheitsmäßig riskant Alkohol konsumiert und psychosozial stark belastet ist. Der Anteil der gefährdeten Jugendlichen in dieser Zielgruppe ist jedoch höher als in vergleichbaren Altersgruppen in der Allgemeinbevölkerung.**

2.2 Risiken und Folgen

Der Konsum von Alkohol stellt einen der drei bedeutendsten Risikofaktoren dar, die zu der globalen Krankheitsbelastung beitragen (Lim et al., 2012). Für Kinder und Jugendliche mit episodisch exzessivem Alkoholkonsum¹ stellen insbesondere die unmittelbaren und mittelfristigen Folgen riskanten Alkoholkonsums eine große Gefährdung dar (Stolle et al., 2009). Jugendliche, die riskante Mengen Alkohol konsumieren, haben ein erhöhtes Risiko Gewalthandlungen zu erfahren, sowohl als Täter als auch als Opfer (Swahn et al., 2004). Neben psychischen Folgen wie Traumatisierungen sind Verletzungen und Konflikte mit der Polizei eine häufige Folge alkoholisierter Gewalt. Im alkoholisierten Zustand kommt es vermehrt auch zu anderen Risikoverhaltensweisen, wie z.B. alkoholisiertem Autofahren (Sindelar et al., 2004). In Verbindung mit depressiven Störungen und kritischen Lebensereignissen erhöht episodisch exzessives Trinken darüber hinaus das Risiko für Suizidversuche bei Jugendlichen (Windle et al., 1992). Verlieren Jugendliche aufgrund des exzessiven Alkoholkonsums das Bewusstsein, kann es durch Unterkühlung oder Aspiration von Erbrochenem zu schwerwiegenden somatischen Komplikationen kommen. Besonders für Mädchen stellen darüber hinaus ungewollte und/oder ungeschützte sexuelle Kontakte im alkoholisierten Zustand eine Gefährdung dar, die zu ungewollten Schwangerschaften und Geschlechtskrankheiten bis hin zu Traumatisierungen durch Vergewaltigungserlebnisse führen können (Champion et al., 2004). Mädchen, die Rauschtrinken praktizieren, haben ein 3-fach erhöhtes Risiko, Opfer ungewollter sexueller Handlungen zu werden (Champion et al., 2004). Früher und häufiger episodisch exzessiver Alkoholkonsum steht im Zusammenhang mit einem

1 Die Begriffe „episodisch exzessiver Alkoholkonsum“, „Rauschtrinken“ und „Binge Drinking“ werden hier synonym verwendet. Auf die unscharfen Begrifflichkeiten weisen z. B. Herring et al. (2008) hin.

■ **Tab. 2.1** Funktionen des Substanzkonsums nach Silbereisen und Reese (2001)

Entwicklungsaufgaben	Funktionen des Substanzkonsums
<ul style="list-style-type: none"> • Wissen, wer man ist und was man will (Selbstkonzept und Identität) 	<ul style="list-style-type: none"> • Ausdruck persönlichen Stils • Suche nach grenzüberschreitenden, bewusstseinsweiternden Erfahrungen und Erlebnissen
<ul style="list-style-type: none"> • Aufbau von Freundschaften; Aufnahme intimer Beziehungen 	<ul style="list-style-type: none"> • Erleichterung des Zugangs zu Peergruppen • Exzessiv ritualisiertes Verhalten • Kontaktaufnahme zu gegengeschlechtlichen Peers
<ul style="list-style-type: none"> • Ablösung von den Eltern 	<ul style="list-style-type: none"> • Unabhängigkeit von den Eltern demonstrieren • Bewusste Verletzung der elterlichen Kontrolle
<ul style="list-style-type: none"> • Übernahme von Verhaltensweisen Erwachsener 	<ul style="list-style-type: none"> • Demonstration, Vorwegnahme des Erwachsenseins
<ul style="list-style-type: none"> • Lebensgestaltung, -planung 	<ul style="list-style-type: none"> • Teilhabe an subkulturellem Lebensstil • Spaß haben und genießen
<ul style="list-style-type: none"> • Eigenes Wertesystem 	<ul style="list-style-type: none"> • Gewollte Normverletzung • Ausdruck sozialen Protests
<ul style="list-style-type: none"> • Entwicklungsprobleme 	<ul style="list-style-type: none"> • Ersatzziel verwehrt normativer Entwicklungsziele • Stress- und Gefühlsbewältigung (Notfallreaktion)

erhöhten Risiko für die spätere Entwicklung einer substanzbezogenen Störung (Viner u. Taylor, 2007). Das Risiko für die Entwicklung einer alkoholbezogenen Störung (schädlicher Gebrauch bzw. Abhängigkeitssyndrom) steigt mit einem jüngeren Einstiegsalter in häufigen exzessiven Alkoholkonsum (Stolle et al., 2009). Auch das Risiko für den Konsum weiterer (illegaler) psychotroper Substanzen steigt.

➤ **Trotz des generell abnehmenden Trends des Alkoholkonsums unter Minderjährigen gibt es Kinder und Jugendliche, die exzessiv konsumieren und dadurch einer Vielzahl von akuten, mittel- und langfristigen Gefährdungen und Beeinträchtigungen ausgesetzt sind.**

2.3 Konsummotive und Wirkerwartungen

Die Motive für exzessiven Alkoholkonsum bei Jugendlichen sind vielfältig. Alkoholkonsum und exzessiver Konsum können nach Silbereisen und Reese (2001) auch Funktionen in der Bewältigung von Entwicklungsaufgaben in der Adoleszenz einnehmen. So kann episodisches Rauschtrinken Ausdruck sozialen Protests sein und eine gewollte Normverletzung darstellen. Es kann die Funktion der Individuation von den Eltern erfüllen, oder der Zugehörigkeit zu einer bestimmten Peergroup Ausdruck verleihen (■ Tab. 2.1).

Exzessiver Alkoholkonsum kann aber auch Folge von Unerfahrenheit und Unwissenheit sein oder als Coping Strategie für Stress, Ängste oder andere emotionale Probleme dienen. Nicht zuletzt ist die enthemmende Wirkung von Alkohol oft ein Konsummotiv, da z.B. die Kontaktaufnahme und die Initiierung romantischer Beziehungen erleichtert ist. Diese sozialen Motive werden von Jugendlichen am häufigsten als Grund für den Konsum von Alkohol genannt, deutlich häufiger als die Verstärkung positiven Affektes („drinking to enhance“; Cooper et al., 1995) oder die Vermeidung negativen Affektes („drinking to cope“; Cooper et al., 1995; Kuntsche et al., 2005).

■ **Tab. 2.2** Alkoholwirkerwartungen 15- bis 16-Jähriger in ausgewählten deutschen Bundesländern (Angaben in Prozent). (Hibell et al., 2012)

	Gesamt	Jungen	Mädchen
Habe viel Spaß	76	77	75
Empfinde mich kontaktfreudiger	65	64	66
Fühle mich entspannt	55	63	49
Fühle mich glücklich	55	57	53
Vergesse meine Probleme	48	49	47
Gefährde meine Gesundheit	37	36	38
Tue Dinge, die ich später bereue	25	25	25
Bekomme einen Kater	28	27	28
Kann nicht aufhören zu trinken	12	11	12
Probleme mit der Polizei	10	13	7
Fühle mich krank	11	11	11

➤ **Alkoholkonsum im Jugendalter kann Funktionen bei der Bewältigung von Entwicklungsaufgaben erfüllen, z. B. im Hinblick auf Identitätsentwicklung und Peergroupenzugehörigkeit.**

Während Konsummotive die Gründe für den Konsum widerspiegeln, d. h. die Absicht, ein bestimmtes erwünschtes Ergebnis herbeizuführen (Cox u. Klinger, 1988), spiegeln Wirkerwartungen persönliche Überzeugungen in Bezug auf positive oder negative (d. h. beabsichtigte und unbeabsichtigte) Effekte des Konsums wider (Kuntsche et al., 2005). Alkoholwirkerwartungen beeinflussen das Einstiegsalter in den Alkoholkonsum (Jester et al., 2015), den Konsum selbst und die Wirksamkeit von Alkoholinterventionen (Black et al., 2012).

In einer repräsentativen Befragung unter Schülerinnen und Schülern in Deutschland im Alter von 15 bis 16 Jahren gaben zwei Drittel der Jugendlichen „Spaß haben“ als die am häufigsten erwartete Wirkung von Alkoholkonsum an (Hibell et al., 2012; ■ Tab. 2.2). Nur ca. ein Drittel der Jugendlichen erwarteten durch Alkoholkonsum ihre Gesundheit zu gefährden, lediglich ein Viertel der Befragten gab an, Bedenken zu haben, dass sie unter Alkoholeinfluss Dinge tun könnten, die sie später bereuen könnten.

➤ **Die Mehrheit der Jugendlichen konsumiert Alkohol aus sozialen Motiven und hat eine gering ausgeprägte Wahrnehmung potenzieller negativer Folgen des Konsums.**

2.4 Modelle jugendlichen Alkoholkonsums

Der Konsum von Alkohol erfüllt im Jugendalter deutlich andere Funktionen als im Erwachsenenalter und ist in der präventiven Arbeit stets vor diesem jugendspezifischen Hintergrund zu verstehen. Alkoholkonsum im Jugendalter wird daher vielfach als Risikoverhalten konzeptionalisiert (Jessor et al., 1987, 1991; Wiers et al., 2007, 2010; Gibbons et al., 2003); im

Gegensatz dazu verstehen Missbrauchs- und Abhängigkeitsmodelle des Erwachsenenalters (s. West, 2013, für eine Übersicht) Alkoholmissbrauch häufig als dysfunktionale Copingstrategie (z. B. Orford, 2001).

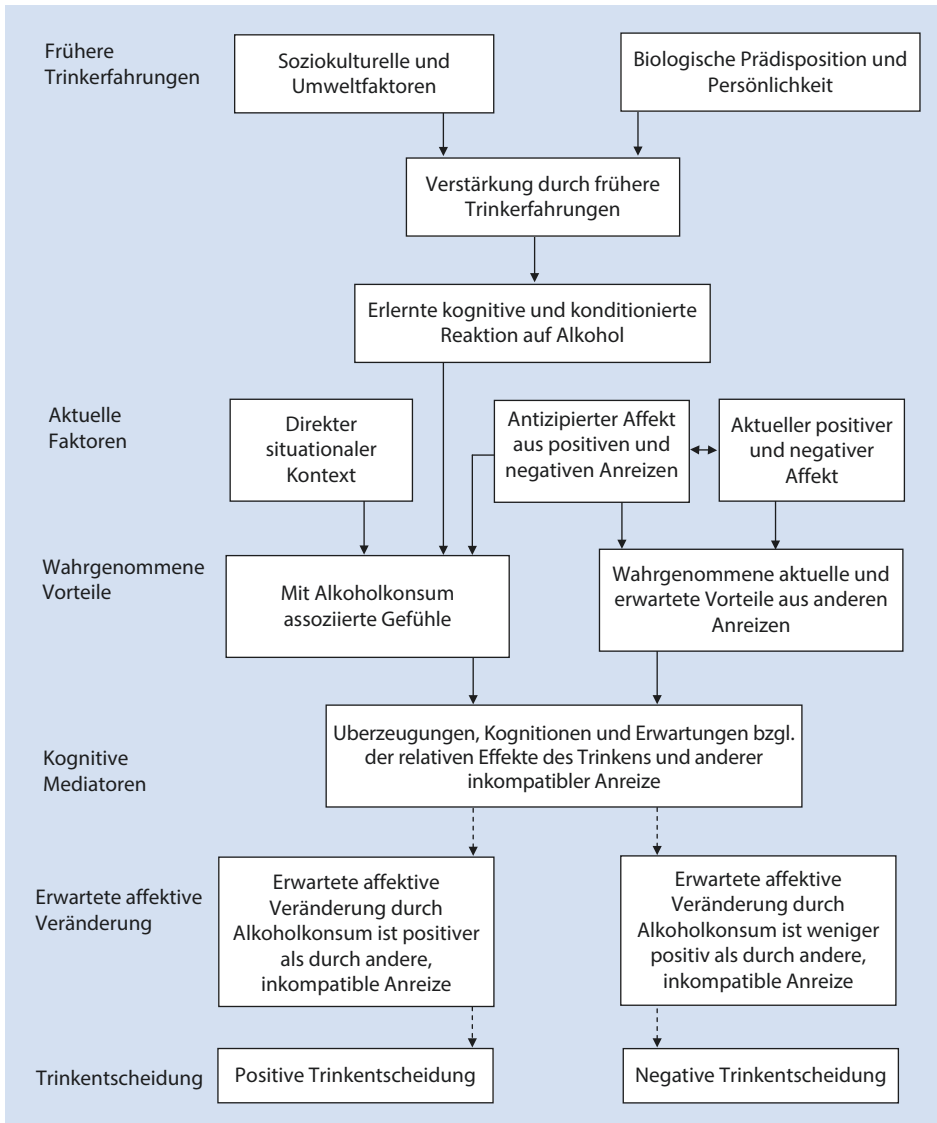
Im Folgenden werden drei Modelle mit direktem Anwendungsbezug zur Entstehung und Aufrechterhaltung jugendlichen Alkoholkonsums vorgestellt, die unterschiedliche relevante Schwerpunkte setzen.

1. das *Motivational Model of Alcohol Use* (Cox u. Klinger, 1988, 2004, 2011) mit besonderem Fokus auf der Rolle der Motivation,
2. das *Social Reaction Model of Adolescent Health Risk* (Gibbons et al., 2003), welches einen besonderen Fokus auf die jugendspezifische soziale Einbettung des Alkoholkonsums legt und damit auf die Bedeutung des Konsums für die Identitätsentwicklung als zentraler Entwicklungsaufgabe im Jugendalter,
3. das *Dual Process Model of Adolescent Risk Taking* (Wiers et al., 2007, 2010), welches die Dialektik von reflektierten, kontrollierten und automatischen, impulsiven Prozessen in der Entstehung und Aufrechterhaltung riskanten Alkoholkonsums im Jugendalter hervorhebt.

2.4.1 Motivational Model of Alcohol Use

Dieses biopsychosoziale Modell (Cox u. Klinger 1988, 2004, 2011) wurde nicht speziell für jugendlichen Alkoholkonsum aufgestellt, bietet jedoch einen sehr guten Überblick über Einflussfaktoren und motivationale Prozesse, die in die Entscheidung, Alkohol zu trinken oder darauf zu verzichten, einfließen. In Übereinstimmung mit neueren Dual-Process-Modellen (s. Wiers et al., 2007, 2010), nimmt auch dieses Modell an, dass sowohl bewusste als auch unbewusste Faktoren die Trinkentscheidung beeinflussen. Hierbei wirken vorangegangene Erfahrungen mit Alkoholkonsum wie auch aktuelle Trinkumstände auf die wahrgenommenen Vorteile einer positiven Trinkentscheidung aus. Unter vorangegangenen Erfahrungen werden Persönlichkeitsmerkmale, biologische Prädispositionen wie auch soziokulturelle und Umweltfaktoren verstanden. Je nach Ausprägung dieser einzelnen Faktoren ist der Alkoholkonsum durch vorangegangene Erfahrungen in verschiedenem Maße verstärkt worden und beeinflusst damit erlernte kognitive und konditionierte Reaktionen auf den Konsum von Alkohol. Zentral ist diesem Modell zufolge der Belohnungswert („incentive value“) des Alkoholkonsums, der abhängig ist von der erwarteten Reduktion negativer Affekte bzw. der Verstärkung positiver Affekte oder beidem. Bei Jugendlichen ist die Verstärkung positiver Affekte, wie in ► Abschn. 2.3 beschrieben, als Trinkmotiv deutlich häufiger zu erwarten als bei Erwachsenen. Ein weiteres zentrales Element des Modells ist der Vergleich des erwarteten affektiven Nutzens des Alkoholkonsums mit dem affektiven Nutzen alternativer Belohnungsquellen. Eine Abwägung dieser erwarteten Folgen des Verhaltens führt dann, beeinflusst von kognitiven Variablen, wie z.B. Werten und Überzeugungen, dem Modell zufolge zu der Entscheidung zu trinken oder nicht zu trinken (▣ Abb. 2.3). Dieses Modell veranschaulicht, wie eine Motivation zum Alkoholkonsum oder zum Verzicht auf Konsum entstehen kann und bietet daher eine Grundlage für die Ableitung einer Interventionsstrategie. Insbesondere werden in diesem Modell die Bedeutung von Wirkerwartungen und alternativen Belohnungsquellen hervorgehoben, zwei Elementen, die vielversprechende Ansätze für Interventionen bieten.

Damit gehört dieses Modell zu den weit verbreiteten Erwartung-mal-Wert-Theorien, zu denen auch die einflussreichen Theorien zum Gesundheitsverhalten Theory of Reasoned Action (Fishbein u. Ajzen, 1975) und deren Erweiterung in der Theory of Planned Behavior (Ajzen, 1985; 1991) gehören. Diese Modelle nehmen grundsätzlich an, dass eine Verhaltensabsicht stets



■ **Abb. 2.3** Das Motivational Model of Alcohol Use. (Cox u. Klinger, 2011, mit freundlicher Genehmigung von John Wiley & Sons)

dem entsprechenden Verhalten vorangeht. Eine Verhaltensabsicht ist das Resultat eines Abwägungsprozesses, in den Einstellungen bezüglich des Verhaltens und die erwarteten Folgen eines Verhaltens einfließen, wie auch wahrgenommene subjektive und gesellschaftliche Normen bezüglich dieses Verhaltens. Wenn solche Verhaltenspläne mit entsprechenden Möglichkeiten zur Ausübung des Verhaltens und mit Ressourcen zur Umsetzung zusammenkommen, können Verhaltensziele erreicht werden. Die Theory of Planned Behavior wurde vielfach in ihrem Nutzen zur Vorhersage von Gesundheitsverhalten getestet und hat einen hohen prädiktiven Wert (Armitage u. Conner, 2001). Dennoch weist das Modell insbesondere bei der Vorhersage von impulsiven und

irrationalen Verhaltensweisen, wie z.B. jugendlichem Risikoverhalten, Schwächen auf. Gibbons et al. (2003) entwickelten daher auf der Basis der Theory of Planned Behavior ein Modell zur Vorhersage jugendlichen Risikoverhaltens.

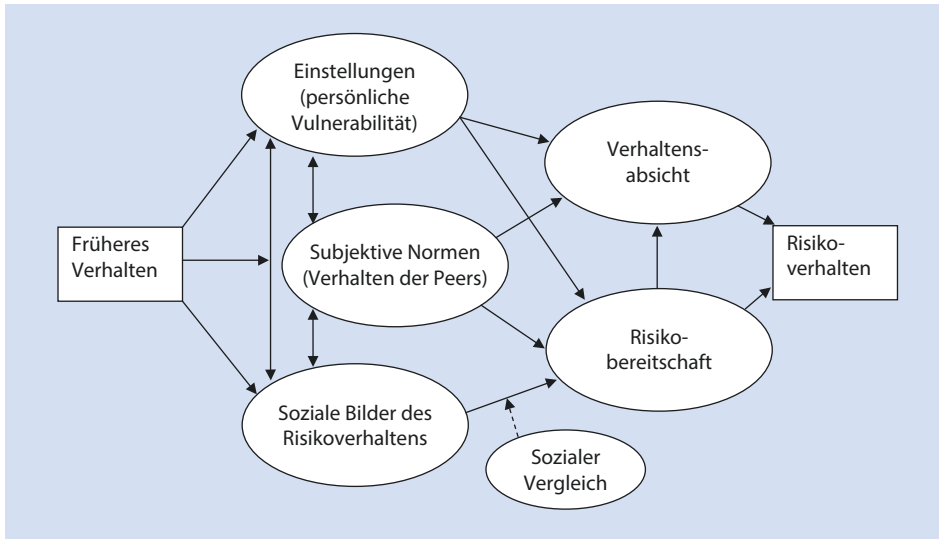
2.4.2 Social Reaction Model of Adolescent Health Risk

Die Bedeutung der sozialen Einbettung jugendlichen Alkoholkonsums wird in dem Social Reaction Model of Adolescent Health Risk von Gibbons et al. (2003) besonders hervorgehoben. Nach diesem Modell wird Alkoholkonsum im Jugendalter als eine soziale Handlung verstanden und, anders als im Erwachsenenalter, in erster Linie als eine Form von Risikoverhalten konzipiert. Gibbons und Mitarbeiter nehmen an, dass zwei unterschiedliche Pfade zu jugendlichem Risikoverhalten führen: Erstens, ein bewusster und abwägender Prozess, in dem entsprechend der Theory of Planned Behavior eine bewusste Verhaltensintention dem Verhalten vorausgeht. Ein zweiter Pfad hingegen beschreibt, wie Risikoverhalten ohne bewusste Absicht und oft als Reaktion auf vorgefundene soziale Situationen entsteht (Abb. 2.4).

Die zentrale Annahme des Modells ist demzufolge, dass Risikoverhalten im Jugendalter oft eine Reaktion auf soziale Situationen ist, das zu einem solchen Verhalten „verführt“. Die zweite Annahme des Modells betrifft den Kontext und die Funktion jugendlichen Risikoverhaltens. Wie in Abschn. 2.3 beschrieben, kann Alkoholkonsum im Jugendalter Funktionen zur Erreichung verschiedener Entwicklungsaufgaben erfüllen, insbesondere Funktionen im Zusammenhang mit der Identitätsentwicklung, der zentralen Entwicklungsaufgabe im Jugendalter (Havighurst, 1948). Das Modell nimmt an, dass mit dem Konsum von Alkohol oder anderen Substanzen im Jugendalter bestimmte soziale Bilder („social images“) verbunden sind. In einer dritten Annahme wird formuliert, dass diese sozialen Bilder, die sog. Prototypen, zu einem sozialen Vergleichsprozess führen, in dem der Jugendliche sich mit den Prototypen vergleicht und im Falle einer positiven Wertung bestrebt ist, dieses soziale Bild in die eigene Identitätswahrnehmung zu integrieren. Eine Reihe von Studien konnte zeigen, dass die wahrgenommenen sozialen Prototypen einen bedeutenden Einfluss auf die Ausübung von Risikoverhalten im Jugendalter haben (z.B. Konsum von Alkohol oder Tabak; Chassin et al., 1981; 1985; Burton et al., 1989).

Ein weiteres zentrales Konstrukt dieses Modells ist die Risikobereitschaft („behavioral willingness“), die die Offenheit gegenüber Risikoverhalten beschreibt. Dieses Konstrukt trägt dem Umstand Rechnung, dass Jugendliche oft angeben, nicht die Absicht zu haben, ein Risikoverhalten auszuführen. Wenn eine Risikosituation jedoch unbeabsichtigt eintritt, ist oft die Bereitschaft vorhanden, das entsprechende Risikoverhalten auch auszuführen bzw. es ist keine Motivation vorhanden, das Risikoverhalten nicht auszuführen. Jugendliche mit einer hohen Risikobereitschaft im Sinne des Modells sind einem besonderen Risiko ausgesetzt, da sie sich nicht auf das Risikoverhalten vorbereiten (z.B. im Falle exzessiven Alkoholkonsums nicht den Heimweg vorab organisieren).

In diesem Sinne nimmt auch das Social Reaction Model zwei Prozesse an, die zusammen jugendliches Risikoverhalten beeinflussen: einen abwägenden, rationalen und einen auf äußere Einflüsse reagierenden, weniger intentionalen Prozess. Mit dieser Annahme spiegelt das Modell die Annahmen aktueller Dual-Process-Modelle wider (Strack u. Deutsch, 2004; Wiers et al., 2007), die auch auf der Grundlage neurobiologischer Forschung davon ausgehen, dass Verhalten von zwei Prozessen, einem reflektierten, bewussten Prozess und einem automatischen, impulsiven Prozess, beeinflusst wird. Diese Modelle unterscheiden sich vom Social Reaction Model in erster Linie durch die Annahme unterschiedlicher Faktoren, die den situationspezifischen Einfluss der beiden Prozesse beeinflussen. Im Folgenden wird das Dual Process Model of Adolescent Risk Taking von Wiers et al. (2007, 2010) vorgestellt.

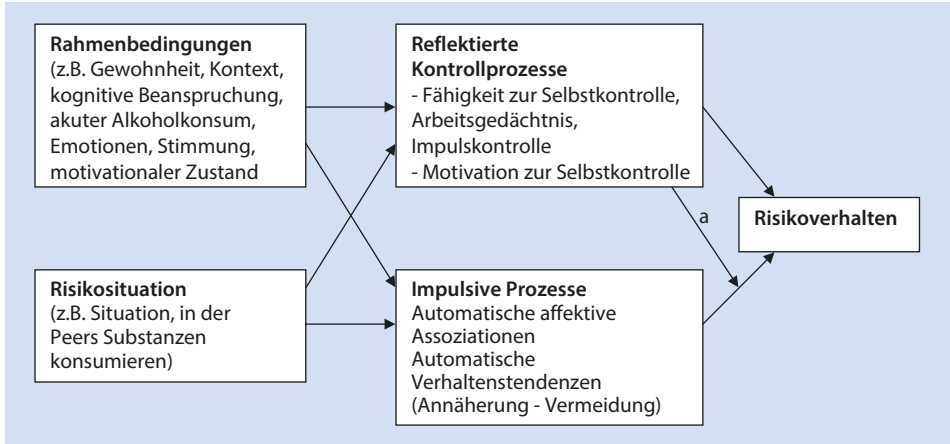


■ **Abb. 2.4** Das Social Reaction Model of Adolescent Health Risk. (Gibbons et al., 2003, mit freundlicher Genehmigung von John Wiley & Sons)

2.4.3 Das duale Prozessmodell jugendlichen Risikoverhaltens

Das duale Prozessmodell jugendlichen Risikoverhaltens nach Wiers et al. (2007, 2010) nimmt, wie oben beschrieben, an, dass jugendliches Risikoverhalten, wie z.B. exzessiver Alkoholkonsum, von zwei Prozessen beeinflusst wird. Dies ist zum einen ein reflektiver, kontrollierter Prozess und zum anderen ein impulsiver Prozess. Ähnlich wie Cox und Klinger (2011) und Gibbons et al. (2003) nehmen Wiers et al. (2010) an, dass frühere Erfahrungen, der Kontext, die Situation sowie emotionale und kognitive Faktoren einen Einfluss auf Risikoverhalten haben. Im Unterschied zu den vorherigen Modellen betonen Wiers und Mitarbeiter aus ihrer neurobiologischen Perspektive die Bedeutung der Fähigkeit und Motivation zur Selbstkontrolle als einen reflektiven Prozess sowie die Bedeutung von automatischen affektiven Assoziationen und „Approach-Avoidance“-Tendenzen in der Entstehung von Risikoverhalten (■ Abb. 2.5). Die Fähigkeit zur Selbstkontrolle ist interindividuell unterschiedlich, unterliegt einem entwicklungsbedingten Reifungsprozess (Steinberg, 2010) und wird durch Umgebungsfaktoren beeinflusst. So reduziert z.B. akuter Alkoholkonsum die kognitive Verarbeitungskapazität („ego depletion“; Baumeister u. Vohs, 2007) und kann damit zu verminderter Fähigkeit und Motivation zur Selbstkontrolle führen, was zu einer Stärkung impulsiver Prozesse führt. Ebenso können sich Gewohnheit, kognitive Beanspruchung, Emotionen, Stimmung und motivationaler Zustand sowohl auf reflektive wie auch auf impulsive Prozesse auswirken. Impulsive Prozesse werden in diesem Modell in erster Linie als automatische Verhaltenstendenzen verstanden, d. h. als eine unbewusste Verhaltensdisposition, auf einen Reiz (z. B. Alkohol) mit Annäherung oder Vermeidung zu reagieren.

Für die praktische Arbeit mit riskant Alkohol konsumierenden Jugendlichen sind insbesondere die Effekte akuten Alkoholkonsums auf das Risikoverhalten (z.B. weiteren Alkoholkonsum oder andere Risikoverhaltensweisen), wie auch der Einfluss impulsiver Prozesse auf das Risikoverhalten von Bedeutung. Die in dem Modell formulierte moderierende Wirkung von reflektiven Prozessen auf den Einfluss impulsiver Prozesse (■ Abb. 2.5, Pfeil a) ist außerdem ein wichtiger Ansatzpunkt für die präventive Arbeit.



■ **Abb. 2.5** Das duale Prozessmodell jugendlichen Risikoverhaltens (gekürzt). (Nach Wiers et al., 2010, © 2010 Wiers, Ames, Hofmann, Krank and Stacy)

2.5 Risiko- und Schutzfaktoren für eine spätere Schädigung durch Alkoholkonsum

Risikant Alkohol konsumierende Minderjährige sind bei jeder einzelnen Konsumgelegenheit einem hohen Risiko ausgesetzt, eine oder mehrere der zum Teil schwerwiegenden akuten Folgen riskanten Konsums zu erleben. Ein Teil dieser Jugendlichen ist darüber hinaus gefährdet, eine alkoholbezogene Störung im Erwachsenenalter zu entwickeln. In einer Studie an 277 jungen Erwachsenen, die 5-13 Jahre nach einer Behandlung aufgrund einer Alkoholintoxikation befragt wurden, erfüllten 12,6% die Kriterien für Alkoholmissbrauch nach DSM-IV und 19,9% die Kriterien für eine Alkoholabhängigkeit, ein deutlich höherer Prozentsatz als in der Allgemeinbevölkerung (Groß et al., 2016a). Als Prädiktoren für späteres Binge Drinking, Alkoholabhängigkeit und eine niedrigere Lebenszufriedenheit wurden männliches Geschlecht, der Konsum von illegalen Substanzen im Jugendalter und mit externalisierenden Störungen assoziierte Verhaltensauffälligkeiten wie Weglaufen und Schulabsentismus identifiziert. Neben Delinquenz und schwachen schulischen Leistungen fand eine aktuelle längsschnittliche Studie an 746 Jugendlichen in Kanada, dass auch das elterliche Monitoring und der Substanzkonsum der Peers einen bedeutenden Einfluss auf den Verlauf des Alkoholkonsums im Kindes- und Jugendalter haben (Yamada et al., 2016). Auch in dieser Studie wurden externalisierende Verhaltensauffälligkeiten als Prädiktoren für besonders schwere Verläufe identifiziert.

Viele Jugendliche reduzieren mit dem Übergang in das junge Erwachsenenalter ihren Konsum („maturing out“; Lee et al., 2013). Bei denjenigen, die aus dem schädigenden Konsum nicht von alleine „herauswachsen“, liegen oft ein oder mehrere intra- oder interindividuelle Risikofaktoren vor. Zu diesen zählen nach einer Übersicht von Jordan und Sack (2008):

- genetische Prädisposition,
- niedriger sozioökonomischer Status der Herkunftsfamilie,
- Geschlecht des Jugendlichen „männlich“,
- problematischer Alkoholkonsum durch andere Familienmitglieder (v.a. der Eltern),
- Vernachlässigung und Misshandlung in der Kindheit,
- frühes Schulversagen,
- Aggressivität,

2.6 · Erkennen riskanten Alkoholkonsums

- Zugehörigkeit zu alkoholkonsumierender Peergroup in später Kindheit und Adoleszenz,
- externalisierende Verhaltensstörungen (Störung des Sozialverhaltens, unbehandelte ADHS),
- Delinquenz in der Frühadoleszenz,
- Impulsivität und Neugier („sensation/novelty seeking“) in der Adoleszenz.

Als Schutzfaktoren für eine spätere Schädigung durch Alkoholkonsum identifizierten Jordan und Sack (2008):

- ausgeglichenes Temperament,
- soziale und emotionale Kompetenzen,
- wenige Konflikte mit den Eltern,
- positive Eltern-Kind-Kommunikation,
- Religiosität/Spiritualität in der Adoleszenz.

In der Arbeit mit riskant Alkohol konsumierenden Kindern und Jugendlichen geht es daher immer auch um das Erkennen von Risikofaktoren als Indikatoren für eine mögliche Gefährdung und die Stärkung von Schutzfaktoren als mögliche Ressourcen zur Prävention späterer Schädigungen durch Alkoholkonsum.

2.6 Erkennen riskanten Alkoholkonsums

Die Unterscheidung zwischen „normativem“ Probierkonsum und schädlichem Alkoholkonsum ist, vor allem für Eltern, im Jugendalter oft schwierig. Eine manifeste Alkoholabhängigkeit nach den Kriterien des ICD-10 ist im Jugendalter eher selten zu beobachten.

Kriterien für das Abhängigkeitssyndrom nach ICD-10 (Dilling u. Freyberger, 2001)

Drei oder mehr der folgenden Kriterien müssen innerhalb des letzten Jahres gleichzeitig erfüllt gewesen sein:

1. Ein starker Wunsch oder eine Art Zwang, Substanzen oder Alkohol zu konsumieren
2. Verminderte Kontrollfähigkeit bezüglich des Beginns, der Beendigung und der Menge des Substanzkonsums
3. Ein körperliches Entzugssyndrom
4. Nachweis einer Toleranz
5. Fortschreitende Vernachlässigung anderer Interessen zugunsten des Substanzkonsums
6. Anhaltender Substanzkonsum trotz Nachweises eindeutiger schädlicher Folgen

Kriterien für den schädlichen Gebrauch nach ICD-10 (Dilling u. Freyberger, 2001)

Für die Diagnose müssen alle folgenden Kriterien zutreffen:

1. Die Diagnose erfordert eine tatsächliche Schädigung der physischen oder psychischen Gesundheit.
2. Schädliches Konsumverhalten wird häufig von anderen kritisiert und hat unterschiedliche negative soziale Folgen.
3. Schädlicher Gebrauch ist bei einem Abhängigkeitssyndrom, psychotischen Störung oder bei anderen substanzbedingten Störungen nicht zu diagnostizieren

Hinzu kommt, dass der Konsum im Jugendalter oft andere Auswirkungen hat, als im Erwachsenenalter, weshalb die Anwendung der ICD-10-Kriterien nur eingeschränkt erfolgen sollte. So werden z.B. häufig erhebliche schädliche Auswirkungen des Alkoholkonsums auf soziale Beziehungen, schulische Leistungen und die Alltagsbewältigung beobachtet, ohne dass die Kriterien Toleranzentwicklung oder körperliches Entzugssyndrom erfüllt sind. Newcomb und Bentler (1989) formulierten daher Kriterien zur Unterscheidung von experimentellem („normativem“) Alkoholkonsum und Alkoholmissbrauch im Kindes- und Jugendalter, die einen ganzheitlicheren Blick auf die Auswirkungen des Konsums auf die Entwicklung des Jugendlichen erlauben:

Kriterien zur Unterscheidung von experimentellem Alkoholkonsum und Alkoholmissbrauch im Kindes- und Jugendalter (Newcomb u. Bentler, 1989)

- **Konsumumstände**
Hinweise auf Alkoholmissbrauch liegen vor, wenn über einen längeren Zeitraum exzessiv konsumiert wird oder der Alkoholkonsum in unangemessenen Situationen (z.B. Schule) auftritt. Es werden also sowohl Konsummenge und -dauer als auch Konsumumstände berücksichtigt.
- **Person**
Ist die altersgerechte Entwicklung des Jugendlichen durch den Alkoholkonsum gefährdet oder kann der Jugendliche entwicklungsbedingt das durch den Alkoholkonsum verursachte Risiko nicht adäquat einschätzen, so besteht Verdacht auf Alkoholmissbrauch.
- **Reaktion**
Beeinträchtigungen in der Alltagsbewältigung, Entzugssymptome und andere Anzeichen einer physischen Abhängigkeit weisen auf einen Missbrauch hin.
- **Konsequenzen**
Anzeichen für einen Missbrauch bestehen bei Beeinträchtigungen der sozialen Beziehungen, der Gesundheit und bei Auftreten gesetzeswidriger Handlungen, die im Zusammenhang mit dem Alkoholkonsum stehen.

Zur Unterstützung der Erkennung riskanten Alkoholkonsums wird der Einsatz von kurzen Screeningtests empfohlen. In dem einleitenden Interview der HaLT-Hamburg-Intervention wird standardmäßig der Screeningtest CRAFFT-d (Tossmann et al., 2009) eingesetzt, der sich als valides Instrument zur Erkennung riskanten Konsums bewährt hat (Wartberg et al., 2016; [Abb. 5.2](#)). Beantwortet ein Jugendlicher 2 oder mehr Fragen mit Ja, so besteht begründeter Verdacht auf riskanten Alkoholkonsum.

Für Menschen mit riskantem Alkoholkonsum wird die Durchführung von motivierenden Kurzinterventionen empfohlen. In der AWMF-S3-Behandlungsleitlinie für Screening, Diagnostik und Behandlung von alkoholbezogenen Störungen im Kindes- und Jugendalter (Thomasius et al., 2016) wird der Einsatz auch bei Kindern und Jugendlichen empfohlen. Motivierende Kurzinterventionen sind besonders als Frühintervention geeignet, um eine intrinsische Motivation zu weiterführender Behandlung und/oder eigenständiger Reduktion riskanter Konsummuster auszulösen und zu stärken. Sie sind aufgrund ihrer Kürze (zwischen 10 und 60 Minuten, 1-3 Sitzungen) besonders geeignet für die Durchführung in Settings, in denen möglicherweise nur wenige Kontakte oder nur ein Kontakt mit dem Klienten realisierbar ist.

2.7 Wirksamkeit von Motivierenden Kurzinterventionen

Die Wirksamkeit von alkoholspezifischen Kurzinterventionen in der primären Gesundheitsversorgung wurde in einer großen Anzahl randomisiert-kontrollierter Studien untersucht und gilt mittlerweile als gut belegt (Kaner et al., 2007; Nilsen et al., 2008; Schmidt et al., 2016). Für Jugendliche und junge Erwachsene liegen allerdings deutlich weniger Studien vor. Die größte Anzahl randomisiert-kontrollierter Studien (RCT) wurde mit amerikanischen College-Studierenden durchgeführt. In einer Metaanalyse über randomisiert-kontrollierte Interventionsstudien zur Effektivität von Kurzinterventionen zum Binge Drinking wurden in dieser Zielgruppe zu verschiedenen Follow-up Zeitpunkten Effektstärken von $d=0,20$ (kleiner Effekt) ermittelt (Carey et al., 2007), nach Angabe der Autoren sind diese im Suchtbereich „typisch“. Bei nicht motivierten Jugendlichen, denen die Teilnahme an einer Kurzintervention als Auflage „verordnet“ wurde (z.B. durch die in den USA verbreitete Campuspolizei), erwies sich die motivierende Kurzintervention insbesondere mit zwei Auffrischungssitzungen, sog. „booster sessions“ einer Standardintervention überlegen.

Das Notaufnahmesetting scheint für Kurzinterventionen bei der Zielgruppe der Jugendlichen prinzipiell geeignet (Monti et al., 1999). Insbesondere vier RCTs einer US-amerikanischen Forschergruppe konnten Effekte von motivierenden Kurzinterventionen für Jugendliche und jungen Erwachsene, die aufgrund eines alkoholbedingten Vorfalls in Notaufnahmen behandelt wurden, auf verschiedene Outcomes berichten (Monti et al., 1999/2007; Spirito et al., 2004/2011). Einige Verbesserungen blieben über 12 Monate stabil (etwa die reduzierte Anzahl der Binge-Drinking-Ereignisse sowie eine mittlere Blutalkoholkonzentration); manche Zielvariablen hingegen blieben unbeeinflusst (etwa Alkohol assoziierte Verletzungen sowie alkoholisiertes Autofahren). In Deutschland wurde die Wirksamkeit einer motivierenden Kurzintervention für Jugendliche und junge Erwachsene unter 21 Jahren nach AAI in einer Hamburger Pilotstudie untersucht (Stolle et al., 2013). Studienteilnehmer berichteten 6 Monate nach der Intervention von einer signifikanten Reduktion der Trinkmenge in den letzten 30 Tagen. Dieses Ergebnis ist als Hinweis auf die Effektivität der Intervention zu verstehen, jedoch ist zu beachten, dass aufgrund der fehlenden Vergleichsmöglichkeit zu dem Trinkverhalten in einer Kontrollgruppe keine kausalen Aussagen über die Ursachen der Reduktion des Konsums getroffen werden konnten. Reis et al. (2009) untersuchten die Effekte der Implementierung einer motivierenden Kurzintervention und kommunaler Alkoholpräventionsstrategien (Projekt HaLT - Hart am Limit) auf die 12-Monats-Prävalenzen Minderjähriger mit AAI in zwei Vergleichsregionen. Sie fanden einen Rückgang der AAI-Prävalenz von 20% in der Experimentalregion und einen Anstieg der Prävalenz um 33% in der Kontrollregion. Auch diese Studie lieferte damit Daten, die die Wirksamkeit dieses Ansatzes stützen. Eine weitere Studie in Deutschland fand ebenfalls, dass Minderjährige mit AAI, die in der Klinik eine motivierende Kurzintervention erhalten hatten, einen Monat nach dem Klinikaufenthalt sowohl ihre Trinkhäufigkeit als auch die Häufigkeit des Binge Drinking signifikant reduziert hatten (Wurdak et al., 2016). Auch in dieser Studie konnte die Entwicklung des Trinkverhaltens jedoch nicht mit einer Kontrollgruppe verglichen werden, die keine Intervention erhalten hatte. Getestet wurde, ob die Anwendung eines Tablet-basierten Interventionsmoduls zu Trinkmotiven mit einer stärkeren Reduktion des Alkoholkonsums assoziiert war als die alleinstehende Intervention. Es zeigte sich, dass Mädchen von dem Zusatzelement profitierten, Jungen hingegen nicht.

Insgesamt liegen wenige randomisiert-kontrollierte Studien zur Wirksamkeit von Kurzinterventionen für Jugendliche im Notfallsetting vor, die aufgrund ihres Alkoholkonsums behandelt werden (Yuma-Guerrero et al., 2012). Newton et al. (2013) analysierten in ihrem systematischen Review eine Untergruppe von Studien, die die Wirksamkeit von „zielgerichteten“ Kurzinterventionen für Jugendliche im Notfallsetting untersuchen, d.h. Kurzinterventionen, die sich an Jugendliche richten, die aufgrund ihres Alkoholkonsums behandelt werden. Sie kommen zu dem Schluss, dass die geringe Anzahl von randomisiert-kontrollierten Studien und die Heterogenität

der Effekte bei der aktuellen Studienlage keine abschließende Beurteilung der Wirksamkeit für diese Zielgruppe erlauben. Ein im Rahmen der HaLT-Hamburg-Studie erstelltes systematisches Review zur Wirksamkeit motivierender Kurzinterventionen für Jugendliche im Notfallsetting, die aufgrund ihres Alkoholkonsums behandelt werden, konnte aufgrund erweiterter Suchkriterien insgesamt 7 randomisiert-kontrollierte Studien, 6 Praxisprojekte, eine nicht randomisierte Pilotstudie und eine Beobachtungsstudie einschließen (Diestelkamp et al., 2016). Aufgrund der Heterogenität der Studiendesigns und der berichteten Effekte kommt auch dieses Review zu dem Schluss, dass die Wirksamkeit alkoholbezogener Kurzinterventionen für diese Zielgruppe aktuell nicht abschließend beurteilt werden kann. Die hohe Anzahl von publizierten Praxisprojekten spiegelt jedoch den Bedarf an wirkungsvollen Interventionen in der klinischen Praxis wider. Motivierende Kurzinterventionen basieren auf dem Gesprächsansatz des Motivational Interviewing (MI) nach Miller und Rollnick (2002, 2013), der im Folgenden dargestellt wird.

2.8 Motivierende Gesprächsführung nach Miller und Rollnick

Die motivierende Gesprächsführung (Motivational Interviewing, abgekürzt MI) ist eine von William R. Miller und Stephen Rollnick (2002; 2013) beschriebene Methode, die sich zunehmend in der Beratung von Menschen mit Suchtproblemen durchgesetzt hat. Im Gegensatz zu früheren Konzepten von Sucht und Abhängigkeit, nach denen Menschen erst an einem Tiefpunkt angekommen sein müssen, bevor eine Verhaltensänderung bewirkt werden kann, gehen Miller und Rollnick davon aus, dass gerade eine frühe Intervention vielversprechend ist.

Die HaLT-Hamburg-Intervention wurde ursprünglich auf Basis der Konzeptualisierung des MI aus dem Jahr 2002 entwickelt (Miller u. Rollnick, 2002). Inhalt und Ablauf der Kurzintervention werden im Praxisteil des Manuals so beschrieben, wie sie ursprünglich ausgearbeitet und in der zugehörigen Studie evaluiert wurden (► Kap. 3). Auf neue Empfehlungen für die Umsetzung der Intervention, wie sie sich aus der 2013 erschienenen 3. Edition des Standardwerkes von Miller und Rollnick ergeben, wird in entsprechenden Fußnoten verwiesen. In dem folgenden Theorieitel des Manuals wird die differenziertere Ausarbeitung der theoretischen Annahmen des MI nach Miller und Rollnick (2013) dargestellt.

Grundlage der motivierenden Gesprächsführung bildet die Annahme, dass Menschen in den meisten Fällen potenziell schädigenden Verhaltensweisen ambivalent gegenüber sind. Das heißt, Tendenzen, ein bestimmtes Risikoverhalten aufzugeben, stehen Tendenzen gegenüber, dieses Verhalten zu wiederholen oder beizubehalten. Die beraterische Praxis hat gezeigt, dass Konfrontation und das zwingende Argumentieren zur Aufgabe eines Risikoverhaltens oft einen gegenteiligen Effekt bewirken. Menschen, und insbesondere Jugendliche, argumentieren in einem Gespräch oft für die Position, die von ihrem Gegenüber *nicht* eingenommen wird. Argumentiert der Berater, dass der Jugendliche seinen Alkoholkonsum dringend einschränken muss, so ist es sehr wahrscheinlich, dass der Jugendliche die Gegenposition einnimmt und eine Reihe von Argumenten anbringt, die belegen, dass sein Konsum in seinen Augen unproblematisch ist.

Dieses Beispiel verdeutlicht eine weitere wichtige Grundannahme im MI. Im MI versteht sich der Berater nicht als Experte, der sein Wissen über das relevante Risikoverhalten an den Klienten weitergibt. Vielmehr geht es im MI darum, dass der Berater versucht, möglichst umfassend die Sicht des Klienten kennenzulernen. Das setzt eine respektierende und wertschätzende Grundhaltung des Beraters voraus. Ein Jugendlicher, der das Gefühl hat, dass sein Verhalten und seine Beweggründe missbilligt und kritisiert werden, wird sich nicht öffnen und vertrauensvoll seine Weltsicht und insbesondere mögliche Zweifel daran erläutern.

Miller und Rollnick verweisen in diesem Zusammenhang auf den sog. Korrekturreflex (Miller u. Rollnick, 2013). Professionelle in den helfenden Berufen sehen sich oft Personen

gegenüber, die ein schädigendes Verhalten, wie z.B. exzessiven Alkoholkonsum, mit schwerwiegenden negativen Folgen für sich selbst und ihr Umfeld ausüben. Der Blick auf die schwerwiegenden negativen Konsequenzen, wie z.B. Gesundheitsschädigungen oder im Falle jugendlichen Alkoholkonsums die mit dem Rauschtrinken verbundenen akuten Gefahren durch Kontrollverlust oder Gewalthandlungen, verleiten Helfer oft zu dem Bedürfnis, dem Klienten „die Augen öffnen“ zu wollen, damit dieser endlich die entscheidenden Schritte unternimmt, das Risikoverhalten zu ändern.

Diese nachvollziehbare und gute Absicht, den Klienten durch Veranschaulichung der negativen Konsequenzen des Status quo zu einer Verhaltensänderung zu motivieren, zeigt sich in der Praxis jedoch häufig als kontraproduktiv. In einer solchen Situation agiert der Berater als Befürworter einer Veränderung und provoziert damit, dass der Klient die Gegenposition einnimmt und Argumente anführt, die für die Beibehaltung des Status quo sprechen. Ziel des MI ist es daher, dem Korrekturreflex nicht nachzugeben, sondern vielmehr ein Gespräch auf eine Art und Weise zu gestalten, dass der Klient seine eigenen Werte und Ziele exploriert, dadurch mögliche Diskrepanzen zu dem aktuellen Verhalten bewusst werden und so eine intrinsische Motivation zu einer Verhaltensänderung entsteht. Der Berater begleitet und unterstützt diesen Prozess mit dem Ziel, dass der Klient zum Fürsprecher seiner eigenen Veränderung wird. In diesem Sinne ist MI eine direktive Art der Gesprächsführung, da sie im Gegensatz zu frühen klientenzentrierten Ansätzen der Gesprächsführung explizit ein Ziel verfolgt, nämlich die Änderung schädigender Verhaltensweisen. Ambivalenz wird dabei als normale Phase einer Verhaltensänderung verstanden und die Auseinandersetzung damit steht im Zentrum des Beratungsgesprächs. Die Motivation zur Veränderung ist dabei keineswegs Voraussetzung, sondern Ziel einer erfolgreichen Beratung (Demmel, 2003).

Das MI wurde seit seiner ersten Beschreibung durch Stephen Miller 1983 ständig weiterentwickelt. Es wird mittlerweile in den unterschiedlichsten Settings (Hausarztpraxen, Kliniken, Beratungsstellen) und für verschiedenste Zielgruppen (Diabetespatienten, Schwangere, HIV-Infizierte) eingesetzt. Darüber hinaus sind die Wirksamkeit und Wirkmechanismen des MI in einer Vielzahl von Studien untersucht worden, deren Ergebnisse die Weiterentwicklung der theoretischen Grundlagen des MI stetig angeregt haben. In der aktuellsten Ausgabe des Lehrbuches *Motivational Interviewing* (Miller u. Rollnick, 2013) werden drei Definitionen für MI, jeweils mit unterschiedlicher Zielsetzung, gegeben. In der deutschen Ausgabe werden die Definitionen folgendermaßen übersetzt:

Definitionen für das Motivational Interviewing (nach Miller u. Rollnick, 2015, S. 473)

Allgemeine Definition:

Ein kooperativer Gesprächsstil, der darauf gerichtet ist, die Eigenmotivation einer Person und ihre Selbstverpflichtung zur Veränderung zu stärken.

Therapeutische Definition:

Ein personenzentrierter Beratungsstil, der an dem häufigen Problem der Ambivalenz gegenüber einer anstehenden Veränderung ansetzt.

Technische Definition:

Ein kooperativer, zielorientierter Kommunikationsstil, bei dem die Aufmerksamkeit in besonderem Maße auf das Sprechen über Veränderung gerichtet ist. Er ist darauf ausgelegt, die Motivation und Selbstverpflichtung einer Person zur Erreichung eines bestimmten Ziels zu stärken, indem in einer von Akzeptanz und Mitgefühl geprägten Atmosphäre die eigenen Gründe der Person, aus denen eine Veränderung gut für sie wäre, herausgearbeitet und erkundet werden.

2.8.1 Die therapeutische Grundhaltung im MI

Das besondere Kennzeichen des MI, die therapeutische Grundhaltung, ist das Herzstück dieses Beratungsansatzes und wurde seit der ersten Konzeptualisierung praktisch nicht verändert. Diese Grundhaltung ist mehr als nur eine Haltung, die in einem therapeutischen Gespräch eingenommen werden soll. Sie ist Ausdruck eines Menschenbildes, das darauf beruht, dass jeder Mensch ein Recht auf Respekt und Würde hat. Das bedeutet, dass die Sichtweise des Klienten als Grundlage des Gesprächs stets respektiert und nicht infrage gestellt wird. Jeder Mensch besitzt demnach Weisheit über sich selbst und das größte Expertenwissen über sich selbst. In Anerkennung dessen respektiert der Berater stets die Autonomie des Klienten. Es liegt allein in der Macht des Klienten, sein Verhalten zu ändern oder dies nicht zu tun. Eine von außen aufgezwungene Veränderung kann nach dem Verständnis des MI nicht nachhaltig sein. Die therapeutische Beziehung ist dementsprechend eine partnerschaftliche, in der es kein Machtgefälle zwischen Behelndem und Behelrtem gibt. Miller und Rollnick (2013) nutzen das Bild, dass Berater und Klient nebeneinander auf dem Sofa sitzen und gemeinsam in dem Fotoalbum des Lebens des Klienten blättern. Eine solche gemeinsame, partnerschaftliche Perspektive auf das Risikoverhalten soll im MI eingenommen werden.

Die vier Kernaspekte der MI Grundhaltung (■ Abb. 2.6) sind

1. Partnerschaftlichkeit/Kooperation,
2. Akzeptanz,
3. Mitgefühl und
4. Evokation.

Die akzeptierende Grundhaltung findet ihre Umsetzung in vier Bereichen. Erstens, in der Anerkennung und Unterstützung der Autonomie des Klienten. Zweitens, in der Ausübung von „präziser Empathie“. Darunter wird das möglichst präzise und wertfreie Einfühlen in die Sichtweise des Klienten verstanden. Mit der Spezifizierung „präzise“ weisen Miller und Rollnick darauf hin, dass es im MI nicht nur darum geht, eine empathische Atmosphäre im Gespräch herzustellen. Vielmehr geht es hier um eine Haltung, die ein echtes Interesse daran beinhaltet, die Lebenswelt des Gegenübers so genau wie möglich kennen und verstehen zu lernen, da diese Klärung einer gemeinsamen Sichtweise die Grundlage für ein fruchtbares Gespräch darstellt. Das Interesse daran, sich auf die Sichtweise der Jugendlichen einzulassen, ohne diese zu bewerten oder gar zu kritisieren, erzeugt Akzeptanz statt Abwehr. Wesentliches Ziel ist es, durch offene Fragen und Reflexion Handlungsmotive zu identifizieren und die zugrunde liegenden Bedürfnisse zu thematisieren. Als dritten Bereich der akzeptierenden Grundhaltung nennen Miller und Rollnick die bedingungslose Wertschätzung des Klienten als Voraussetzung für ein offenes Gespräch, in dem der Klient ohne Angst vor Kritik oder Verurteilung wahrgenommene Schwächen oder Zweifel thematisieren kann. Der vierte Bereich der Akzeptanz ist die Würdigung, die besonders die Ressourcenorientierung des MI widerspiegelt. Statt Defizite und Probleme zu identifizieren und zu bearbeiten, konzentriert sich der Berater im MI darauf, Stärken und Bemühungen zu identifizieren und durch Würdigung zu stärken.

Als dritten Kernaspekt der MI-Grundhaltung neben Kooperation/Partnerschaftlichkeit und Akzeptanz, nennen Miller und Rollnick das Mitgefühl und meinen damit das authentische Streben des Beraters, MI zum Wohle des Klienten einzusetzen. Dieser Aspekt hat den Hintergrund, dass MI in der Vergangenheit auch dazu eingesetzt wurde, Kaufentscheidungen von Kunden im Interesse von Konzernen zu beeinflussen mit entsprechend fragwürdigem Nutzen für die Kunden.

Der vierte Aspekt der MI-Grundhaltung ist die sog. Evokation. Unter Evokation wird die Annahme verstanden, dass Klienten Expertenwissen über sich selbst und daher auch Lösungsansätze für ihre Probleme in sich tragen und die Aufgabe des Beraters daher besteht, den Klienten dabei zu unterstützen, diese Lösungen hervorzubringen („evozieren“).

Publication IV. Short- to Midterm Effectiveness of a Brief Motivational Intervention to Reduce Alcohol Use and Related Problems for Alcohol Intoxicated Children and Adolescents in Pediatric Emergency Departments: A Randomized Controlled Trial.

Reference. Arnaud, N., Diestelkamp, S., Wartberg, L., Sack, P.-M., Daubmann, A. & Thomasius, R. (2017). Short- to Midterm Effectiveness of a Brief Motivational Intervention to Reduce Alcohol Use and Related Problems for Alcohol Intoxicated Children and Adolescents in Pediatric Emergency Departments: A Randomized Controlled Trial. *Academic Emergency Medicine*, 24, 186-200.

Format. published article

Short- to Midterm Effectiveness of a Brief Motivational Intervention to Reduce Alcohol Use and Related Problems for Alcohol Intoxicated Children and Adolescents in Pediatric Emergency Departments: A Randomized Controlled Trial

Nicolas Arnaud, PhD, Silke Diestelkamp, MSc, Lutz Wartberg, PhD, Peter-Michael Sack, PhD, Anne Daubmann, MSc, and Rainer Thomasius, MD

ABSTRACT

Objectives: The proportion of children and adolescents receiving emergency care for acute alcohol intoxication (AAI) in Germany has sharply increased over the past years. Despite this, no randomized controlled trials (RCTs) have studied guideline- and evidence-based interventions to prevent future alcohol misuse within this population. The objective of our investigation was to evaluate the effectiveness of a brief motivational intervention (b-MI) to reduce drinking and associated problems within pediatric emergency departments (PED) in Hamburg, Germany.

Methods: This stratified cluster-RCT compared a widely established but modified targeted b-MI and treatment as usual (TAU) for patients recruited and treated on Fridays, Saturdays, or Sundays from July 2011 to January 2014 for AAI in EDs of six pediatric hospitals in Hamburg, Germany. Patients under the age of 18 years and their caregivers were included in the study. Intervention was delivered by trained hospital-external staff. The intervention group ($n = 141$) received a single-session b-MI with a telephone booster after 6 weeks and a brief consultation for caregivers. All intervention material was manual-based. The TAU control group ($n = 175$) received youth-specific written information on alcohol use and contact information for community resources. Primary outcomes were changes in binge drinking frequency, number of alcoholic drinks on a typical occasion, and alcohol-related problems using the brief Rutgers Alcohol Problem Index. Outcomes were measured by research assistants not involved in intervention delivery. Baseline data were collected in person at the PED, and follow-up data were collected via telephone 3 and 6 months after baseline. Secondary outcome was postenrollment health service utilization. Analyses were based on linear mixed models and intent to treat.

Results: A total of 86.1% (87.5%) of patients in the b-MI group and 82.4% (86.9%) in the TAU group provided valid outcome data after 3 (6) months, respectively. The differences between groups for all outcomes were statistically nonsignificant at both follow-ups ($p > 0.05$). After 3 months the mean change in binge drinking frequency was -1.36 (95% confidence interval [CI] = -1.81 to -0.91), a reduction of 62.1% in the b-MI group, and

From the German Centre for Addiction Research in Childhood and Adolescence (DZSKJ) (NA, SD, LW, PMS, RT) and the Department of Medical Biometry and Epidemiology (AD), University Medical Centre Hamburg-Eppendorf, Hamburg, Germany.

Received May 3, 2016; revision received June 29, 2016; accepted October 19, 2016.

Presented at the 12th International Network on Brief Interventions for Alcohol and Other Drugs (INEBRIA) Conference, Atlanta, GA, September 24–25, 2015.

This research was supported by a grant from the German Federal Ministry for Education and Research (BMBF), 01KQ1002B.

Current Controlled Trials Identifier: ISRCTN31234060.

The authors have no potential conflicts to disclose.

Supervising Editor: Steven B. Bird, MD.

Address for correspondence and reprints: Nicolas Arnaud, PhD; e-mail: n.arnaud@uke.de.

ACADEMIC EMERGENCY MEDICINE 2017;24:186–200.

-1.29 (95% CI = -1.77 to -0.95), a reduction of 49.0% in the TAU group. The mean change in number of alcoholic drinks on a typical occasion was -2.24 (95% CI = -3.18 to -1.29), a reduction of 37.5% in the b-MI group, and -1.34 (95% CI = -2.54 to -0.14), a reduction of 26.4% in the TAU group. The mean change of alcohol-related problems was -6.72 (95% CI = -7.68 to -5.76), a reduction of 60.5% in the b-MI group, and -6.43 (95% CI = -7.37 to -5.49), a reduction of 58.3% in the TAU group. The differences in mean changes between groups were similar after 6 months for all outcomes.

Conclusion: This study provides new information on the effectiveness of b-MIs delivered at discharge of young AAI patients in emergency care. Both trial groups reduced alcohol use and related problems but the b-MI was not associated with significant effects. Although the intervention approach appears feasible, further considerations of improving the outcomes for this relevant target group are required.

Germany belongs to the countries with the highest per-capita consumption of alcohol in the world.^{1,2} Drinking typically starts at the age of 13 years, which is comparable, for instance, to the United States,³ even though the minimum legal age for purchasing and consuming alcohol is low in Germany (16 years for beer and 18 years for spirits compared to 21 years in the US). Serious at-risk drinking as indicated by AUDIT-C scores in a national representative sample⁴ is prevalent among 16% of 11- to 17-year-old adolescents in Germany and episodic heavy (“binge”) drinking (i.e., five drinks or more consumed on one occasion) among school-aged teenagers is high compared to other regions in the world such as the United States.^{5,6} Associated negative effects of early excessive drinking can severely impact on physical, psychological, and social functioning and prevention and early intervention of future harms from drinking is an important public health goal.^{7,8}

In Germany, overall alcohol use in youth has decreased in the past 15 years.⁹ However, this period has been marked by a sharp increase in the number of children and adolescents who received emergency medical treatment for acute alcohol intoxication (AAI). Annual hospital admissions for AAI as primary diagnosis total 119,000 patients in Germany with 22,400 individuals aged 19 years or younger,¹⁰ a number that is close to the estimated 3% 12-month prevalence in Europe.⁶ Substantial proportions of this population are at risk for ongoing and further alcohol misuse that warrants appropriate treatment,¹¹⁻¹³ yet the implementation of evidence-based interventions is not standard practice in pediatric emergency departments (PEDs) across Europe thus far.¹⁴

However, emergency care in Europe has initiated practice projects to address this particular patient population (see Diestelkamp et al.¹⁴ for an overview). In Germany the targeted alcohol prevention project HaLT-Hart am Limit [Stop-Close to the Limit¹⁵] involves a brief single counseling session based on motivational interviewing (MI) for AAI patients in

PEDs. This practice project has established a broad national network of cooperating institutions and is one of the most widely disseminated youth alcohol prevention projects in Germany but to date it has not been tested in randomized controlled trials (RCTs).

Overall the literature on brief alcohol interventions in ED settings targeting children and adolescents is relatively sparse compared to the evidence base for adults.¹⁶ Nevertheless the HaLT approach draws on prior research, which in summary indicates several things: first, brief collaborative and strength-based motivational enhancement interventions such as MI can encourage motivation and commitment for health-related behavior change among nonactively treatment-seeking youth.¹⁷⁻²⁰ Second, such interventions can effectively be transported to the constrained and time-limited ED context where interventions need to be brief (i.e., single session).^{21,22} Third, hospitalization can be associated with a state of increased responsiveness to alcohol-related interventions (i.e., “teachable moment” [TM]).^{23,24} Fourth, brief motivational interventions (b-MIs) have the potential to be effective when they directly follow a negative alcohol-related event (such as alcohol intoxication or alcohol-induced injury)²⁵⁻²⁷ and, fifth, awareness of alcohol having prompted PED hospitalization, booster sessions, and parental engagement influence b-MI outcomes.²⁸

These results hold promise for b-MI delivered to adolescent patients treated primarily for alcohol intoxication; however, to date no randomized clinical studies have examined effects in this population.^{14,29,30} Therefore, the primary purpose of this trial was to determine the effectiveness of a single session b-MI (HaLT-Hamburg) for children and adolescents with AAI at PED discharge with a telephone booster and parental component in comparison to treatment as usual (TAU). We hypothesized that the b-MI would be more effective than TAU with respect to a decrease in alcohol use and related problems. Furthermore, we expected higher rates of postenrollment health service utilization in the b-MI group. If b-MI is effective in

improving these outcomes this would provide an evidence base for an established but thus far not rigorously tested brief intervention model (HaLT- Hart am LimiT project) with available resources for broad dissemination that could be used to bridge the gap between current knowledge and clinical practice.^{31,32}

METHODS

Study Design

This was a stratified cluster-RCT of a targeted b-MI for youth under the age of 18 years presenting at PED for AAI. The study was part of a larger network for mental health promotion and health services research (psychenet: the Hamburg Network for Mental Health³³) and was implemented within a network of researchers, community administrators, service providers, and health insurances.³¹ Written informed consent was obtained from all participants. Written parental consent was obtained if parents were present; if not, a consent form to opt out was given. Study procedures were approved by the ethics committee of the Chamber of Psychotherapists Hamburg, Germany. The trial design was published³⁴ and no content or major methodologic modifications were made after trial commencement.

Study Setting and Population

The study took place in six PEDs spanning the metropolitan area of the City of Hamburg, Germany, with an average annual inpatient treatment demand for AAI of 216 patients (48% female) under the age of 18, for the years 2011 through 2013.³⁵ At project launch PED directors were invited to a network conference, informed about the aims and procedures of the project, and asked to participate. Funding of PED-external intervention facilitators was obtained from public health insurers and managed by the Hamburg authorities for Health and Consumer Safety (BGV). The BGV also issued an official instruction for the city's rescue coordination center to transfer youth with AAI to one of the participating PEDs. b-MIs were delivered in the PED during the morning before discharge by trained and supervised counselors with at least a masters' degree in psychology, social education work or related fields, and experience in working with youth and their parents.

Eligible for study participation were patients under the age of 18 years with AAI as primary diagnosis (ICD-10 diagnosis F10.0) and their caregivers. Youth

enrolled in the study were those who had sufficiently recovered from the event, were fluent in German language, were not critically injured and mentally or physically not impaired, and provided informed consent (including detailed information on the study procedures and content, confidentiality and data security, voluntariness of participation, and right to withdraw consent at any time). Criteria for eligibility were broad, reflecting clinical practice and requirements for enrollment in the national HaLT-project. Participants were enrolled from July 2011 through January 2014 in the participating PEDs in Hamburg, Germany, and restricted to Fridays through Sundays, which was determined adequate to reach a majority of patients in a pilot study.³⁶ Participants received shopping vouchers for completing baseline and follow-up data.

Study Protocol

Procedure. Coordination of attendance and resource availability was managed by a standardized operation schedule for each weekend during the recruitment period.^{34,37} Each Friday at 7 A.M. trained research assistants (RAs) contacted PED staff to determine whether eligible patients had presented for AAI. If this was the case and the patient had neither been discharged in the same night nor left the PED against medical advice, the RA contacted one of the stand-by counselors that were available for this weekend. RAs then visited the PED and conducted baseline interviews in privacy from accompanying parents or caregivers with those patients who gave informed consent and met the initial study eligibility criteria.

Randomization. Because of a potentially clustered data structure (patients nested in PEDs) and a planning demand for intervention delivery at each weekend, individual random assignment was not appropriate. Instead random assignment was based on stratified clusters with PEDs on a weekend as unit of randomization and weekend over the 30-month enrollment period as stratum. The total amount of possible combinations between strata and hospitals was balanced in a way that each clinic acted equally often as TAU and b-MI condition and assured that all clinics were either TAU or b-MI condition at each weekend. This procedure led to a high amount of possible clusters.

Data Collection and Measures. All assessment instruments were based on self-reports. At baseline we collected basic demographic data on age, sex, school

status (currently in school, yes/no) and migration background. To characterize the level of clinical risk associated with the sample, we also included a screening for alcohol use-related risk using the German version³⁸ of the CRAFFT (car, relax, alone, forget, friends, trouble; six items, e.g., “Do you ever use alcohol to relax, feel better, or fit in?” “Do you ever use alcohol or drugs while you are by yourself, alone?”; yes/no response format with scores > 2 indicating high risk; Cronbach’s $\alpha = 0.53$) and a validated screening for psychosocial problems using the Screening for Mental Disorders in Adolescence³⁹ subscales (each eight items) for internalizing (anxiety/depression, Cronbach’s $\alpha = .89$; and self-esteem, Cronbach’s $\alpha = 0.71$) and externalizing (aggressive-dissocial behavior, Cronbach’s $\alpha = 0.78$; and anger control problems, Cronbach’s $\alpha = 0.75$). Baseline data collection was done at the PED (“at bedside”) prior to discharge by RAs not involved in intervention delivery. Follow-up outcome assessments were conducted by RAs via telephone 3 and 6 months postenrollment respectively.

Outcome Measures. Primary trial outcomes were changes from baseline to follow-up (3 and 6 months) in binge drinking frequency, number of alcoholic drinks on a typical drinking occasion and alcohol-related problems. Binge drinking was specified as the first of the ordered primary outcomes because it increases the risk for and often precedes AAI and was assessed for the past month using a single question (“How often did you have 5 (4 for girls) or more drinks on one occasion?”). Additional primary outcome was the number of alcoholic drinks consumed on a typical drinking occasion. For both outcomes, we considered 1 unit of alcohol (standard drink) to include 10 g of ethanol, and we used a graphical overview of various types of drinks to help respondents answer the question, ensuring standardized responses. To assess alcohol-related problems we used the youth-specific brief version of the Rutgers Alcohol Problems Index (brief RAPI),⁴⁰ with 16 items assessing whether the individual has experienced negative consequences from drinking alcohol (e.g., “got into a fight with other people [friends, relatives, strangers]”, “Neglected your responsibilities”; “never” to “more than 10 times”; Cronbach’s $\alpha = 0.87$), in the past 3 months. Secondary outcome was the proportion of patients reporting health service utilization postenrollment (yes/no), as treatment seeking is a strong indicator for

change motivation.⁴¹ We counted whether patients have received any treatment or community-based youth or family service (alcohol-, mental health-, youth-, or family-related treatment, service, or support organization or other). To examine counselors’ MI skills, patients in the b-MI group rated counselors’ empathy, affirmation, competence, and congruency using the short version of the index of basic therapeutic skills (BIS)⁴² on a 4-point Likert scale (e.g., “counselor respects me and cares for me”; 1 = “totally disagree”, 4 = “totally agree”; Cronbach’s $\alpha = 0.91$).

Intervention Conditions and Implementation

The intervention group received a manual-guided b-MI of approximately 45 minutes’ duration which was modeled on the original HaLT-Hart am Limit counseling session^{15,43} and brief ED alcohol interventions^{22,25,27} based on principles of MI, motivational enhancement interventions, and directive counseling.^{18,44,45} Intervention development involved extensive participatory work with cooperating clinical and counseling experts to promote a balance between structured delivery and practitioners’ needs for flexibility and client-focused implementation.^{31,46} The goal of the intervention was to stimulate and provide resources for the adolescent’s abilities, capacities, and motivation to reflect and regulate alcohol-related behavior and goal attainment. It formalizes principles of reflective listening and empathic feedback; nonconfronting and nonjudgmental assessment of the circumstances associated with the intoxication and alcohol-related risk behaviors; exercises for exploration of drinking-related attitudes, norms and goals, and goal attainment strategies (including decisional balance and goal-setting exercises); a reflective summary emphasizing personal responsibility for behavior and behavior change; and finally a written agreement on behavior goals and provision of relevant contact information of youth-specific services (see Diestelkamp et al.³⁴ for a more detailed description; a flowchart of the intervention is provided in Data Supplement S1, available as supporting information in the online version of this paper). Caregivers received a brief consultation by the same counselor who delivered the b-MI to youth, including general information on youth alcohol use and related risks and encouragement to reflect on the AAI episode of their child and that developed strategies to prevent future risky alcohol use and/or to seek further family- and/or substance use-related services if required. Afterward parents, counselor, and adolescent

reunited for a summary statement that focused on supporting the adolescent's self-efficacy regarding their alcohol-related goals. All counselors were initially trained by experienced MI-trainers (12 h of training) and supervised on a bimonthly basis to discuss problems and experiences of implementation, engage in role-plays, and receive retraining if required. Participants were contacted by telephone 6 weeks postenrollment to reinforce motivation toward goal attainment outlined during the b-MI session and discuss perceived barriers encountered in reaching these goals (5 to 10 min). Participants in the TAU control group were approached by a RA and received an information leaflet on negative consequences of alcohol misuse, as well as contact details of the cooperating youth substance use counseling service, with a recommendation for contact.

Data Analysis

Study eligibility and enrollment were summarized according to Consolidated Standards of Reporting Trials (CONSORT) statement extensions for cluster-randomized trials⁴⁷ and analyses were based on intent to treat. We compared baseline characteristics for all randomized participants by intervention arm and examined factors associated with loss to follow-up. Multiple imputation (10 imputations; fully conditional specification method) was used to account for missing follow-up outcome data and single missing values.⁴⁸

The sample size was calculated for the three primary outcomes: binge-drinking frequency, number of alcoholic drinks on a typical occasion, and alcohol-related problems at 3-month follow-up. To detect an anticipated effect size of $d = 0.26$,^{14,26} with a power of 80% and with a type I error of 5% for each of these outcomes, 306 patients (153 patients per group) had to be included, if randomization had occurred at patient level. With an assumed intra-cluster correlation of 0.05 and an average of 1.264 patients per cluster, we calculated a design effect for cluster randomization of 1.013, which increased the required sample size to 312 patients (156 patients per group).

The hypothesis that the b-MI is superior to TAU after 3 and 6 months, respectively, was tested for the three primary outcomes (binge drinking frequency, number of alcoholic drinks on a typical occasion, and alcohol-related problems) using mixed-effects analysis of covariance (ANCOVA) models, with changes from baseline in outcome scores as the dependent variable; group, time, interaction between group, and time as fixed

effects; respective baseline values as covariate; cluster and counselor as random effects; and time as repeated effect. We checked the assumptions of the ANCOVA models using graphical methods like histograms. We report adjusted means with corresponding 95% confidence intervals (CIs), p-values, and Cohen's d effect sizes, which were calculated for each outcome by dividing the difference in mean change between intervention groups by the pooled baseline standard deviation.

Service utilization was estimated using a mixed logistic regression model, with group as fixed effect, and cluster and counselor as random effects. We report group differences in proportions of participants reporting service utilization at both follow-ups with corresponding odds ratios (OR), 95% CIs, and p-values. In these models, an OR of >1 indicates that the b-MI group was more likely to respond with "yes" than the TAU group; an OR of <1 indicates the opposite.

Additionally, we analyzed versions of these models adjusting for possible confounders. Covariates were included in the adjusted model if they correlated significantly with change in outcome from baseline to follow-up or were significant predictors for missing follow-up data (significance threshold $p < 0.05$). For all analyses the two-sided α -level was set to 0.05.

Counselors' perceived MI skills are reported descriptively as an indicator for b-MI delivery in a MI-consistent spirit.⁴⁹ All analyses were performed using SPSS statistical software package (version 22). The trial is registered in a public database (ISRCTN31234060); the sponsors of the study had no role in the study design, data collection, analysis or interpretation, writing the report, or decision to submit results.

RESULTS

Participant Characteristics and Attrition

During the enrollment period (July 2011 through January 2014) the six participating PEDs documented 459 patients under 18 years who had received AAI treatment at weekends and 320 (69.7%) eligible patients were enrolled in the trial (see Figure 1 for participant enrollment and retention). A total of 71 patients (15.5%) could not be assessed for eligibility because they were discharged before standby time (7–9 AM). Among those assessed for eligibility but not enrolled ($n = 58$, 13%) the primary reason for nonenrollment was "not interested" (31 patients, 6.8%); additionally, nine

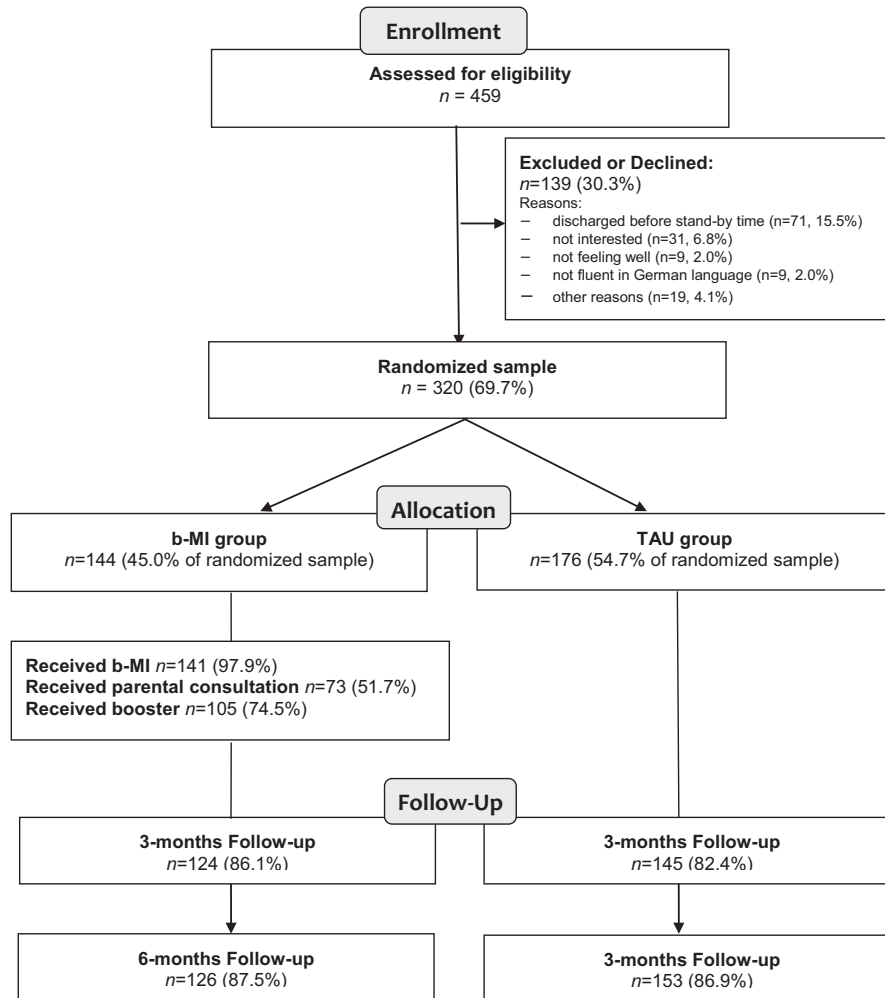


Figure 1. Eligibility assessment, retention, and enrollment flow diagram. b-MI = brief motivational intervention; TAU = treatment as usual.

patients (2%) stated that they were “not feeling well,” nine (2%) were not fluent in the German language, and 19 (4.1%) stated “other reasons.”

Baseline characteristics of enrolled patients are reported in Table 1. Comparisons of randomization groups at baseline indicates that both groups were similar in study variables, except for more participants in the b-MI group scoring above the cut-off for anxiety/depression. Moreover, we included more parents/caregivers of youth in the b-MI group (60.3% compared to 48.9% in the TAU group).

Intervention Effects at 3 and 6 Months Following Baseline

Change in Alcohol Use and Related Problems. Mean change in binge drinking episodes from baseline to 3 and 6 months of follow-up was statistically significant reduced for both groups with larger reductions in the b-MI group (3 months, -1.35 (95% CI = -1.73 to -0.97), $p < 0.001$; 6 months, -1.26

(95% CI = -1.63 to -0.88), $p < 0.001$) compared to the TAU group (3 months, -1.29 (95% CI = -1.77 to -0.81), $p < 0.001$; 6 months, -1.25 (95% CI = -1.81 to -0.70), $p < 0.001$). However, between-group differences were statistically not significantly different at both 3 and 6 months ($p > 0.05$; Table 2 and Figure 2A).

Similarly, mean change in number of alcohol drinks per typical drinking occasion from baseline to 3- and 6-month follow-up was also statistically significant reduced for both groups, again with larger reductions in the b-MI group (3 months, -2.24 (95% CI = -3.18 to -1.29), $p < 0.001$; 6 months, -1.86 (95% CI = -2.85 to -0.86), $p < 0.001$) compared to the TAU group (3 months, -1.34 (95% CI = -2.54 to -0.14), $p < 0.001$; 6 months, -1.61 (95% CI = -2.88 to -0.35), $p < 0.01$). The numerically larger reductions in the b-MI group compared to the TAU group were statistically not significantly different at both 3 and 6 months ($p > 0.05$; Table 2 and Figure 2B).

Table 1
Baseline Sociodemographic and Substance use-related Characteristics of the 316 Child and Adolescent Study Participants

Characteristic	b-MI Group (n = 141)	TAU Group (n = 175)	p-value
Male sex	69 (48.9%)	91 (52.0%)	0.695
Age (y)	15.7 (±1.2)	15.8 (±1.2)	0.420
Not born in Germany	12 (8.5%)	16 (9.1%)	0.878
Father or mother not born in Germany	62 (22.0%)	64 (18.3%)	0.208
Currently in school	118 (83.7%)	160 (91.4%)	0.068
Binge drinking episodes past 30 days	2.72 (±3.71)	2.11 (±2.73)	0.124
Typical quantity of alcoholic drinks past 30 days	6.69 (±4.78)	6.32 (±6.47)	0.603
Alcohol-related problems past 3-months (RAPI score)	11.26 (±9.89)	9.72 (±9.26)	0.181
CRAFFT score (>2)	83 (58.9%)	104 (59.4%)	0.282
Anxiety/depression (above cutoff)	42 (29.8%)	35 (20.0%)	0.035
Self-esteem (above cutoff)	12 (8.5%)	13 (7.4%)	0.709
Aggressive-dissocial behavior (above cutoff)	58 (41.1%)	60 (34.3%)	0.233
Anger control problems (above cutoff)	20 (14.2%)	20 (11.4%)	0.379
Parents' assessment included	85 (60.3%)	84 (48.0%)	0.030

Table includes available data at baseline. Multiple imputation was not conducted for data included in this table. Data are presented as numbers (percentages) of participants or mean (±SD).
b-MI = brief motivational intervention; RAPI = Rutgers Alcohol Problem Index; TAU = treatment as usual.

Mean change in alcohol-related problems from baseline to 3- and 6-month follow-up was also statistically significantly reduced for the b-MI group (3 months, -6.72 (95% CI = -7.68 to -5.76), $p < 0.001$; 6 months, -6.87 (95% CI = -7.81 to -5.93), $p < 0.001$) and the TAU group (3 months, -6.43 (95% CI = -7.37 to -5.49), $p < 0.001$; 6 months, -7.05 (95% CI = -7.92 to -6.18), $p < 0.001$). Again, between-group differences (3 months, -0.29 [95% CI = -0.95 to 1.54]; 6 months, -0.24 [95% CI = -1.48 to 1.01]) were statistically not significantly different at both 3 and 6 months ($p > 0.05$; Table 2 and Figure 2C).

These results are comparable to the results of models adjusted for potential confounders which correlated with outcomes (Data Supplement S2, available as supporting information in the online version of this paper). These were sex, age, school status, cutoff scores for the CRAFFT, and Screening for Mental Disorders in Adolescence (for the subscales anxiety/depression, self-esteem, aggressive-dissocial behavior, and anger control problems). For reasons of parsimony, only the results of the unadjusted analysis are reported in the main article (Data Supplement S3, available as supporting information in the online version of this paper).

Service Utilization. Differences in proportions of patients reporting utilization of any community service organization for mental health or substance use problems were statistically not significant between groups, neither at 3 months (OR = 1.20, 95% CI = 0.65 to 2.21, $p > 0.05$) nor at 6 months (OR = 1.22, 95%

CI = 0.56 to 2.65, $p > 0.05$) postenrollment. For both groups, service utilization was lower for the second follow-up interval (b-MI group—after 3 months 39 of 141 patients [27.9%] and after 6 months 26 patients [18.1%]; TAU group—after 3 months 45 of 175 patients [25.5%] and after 6 months 27 patients [15.1%]; Table 3).

Intervention Fidelity: Patient Ratings of b-MI-counselors. Patient ratings ($n_p = 144$) of counselor ($n_c = 8$) empathy, affirmation, competence, and congruency indicate intervention delivery was in accordance with important MI principles. Ratings ranged from 97.8% “total agree” and “agree” for the item “the counselor accepts me” to 85.1% “total agree” and “agree” for the item “the counselor appears empathic to me.” The average “total agreement” and “agreement” of the eight items was high (94.3%; Figure 3).

DISCUSSION

The literature on brief ED-based interventions for children and adolescents is underdeveloped compared to the evidence base on brief interventions in adults.¹⁶ Thus, studies targeting adolescents are important, given the prevalence of high-risk health-related behavior such as excessive drinking in this age group.^{6,10} Moreover, existing evidence mainly comes from U. S.–American and Australian trials^{21,25,26,50} with unclear implications for high-volume drinking countries in Europe such as Germany.^{11,14} RCTs involving the important group of intoxicated adolescents are missing even though these patients are regarded as a

Table 2
Changes in Primary Outcomes by Study Arm to Baseline versus 3- and 6-month Follow-Up

Outcomes	b-MI Group (n = 141)			TAU Group (n = 175)			Between-group Differences (b-MI vs. TAU)		
	Mean (95% CI)	Mean Change From Baseline		Mean (95% CI)	Mean Change From Baseline		Adjusted Mean (95% CI)	p-value	Effect Size
		Adjusted Mean (95% CI)	Change, %		Adjusted Mean (95% CI)	Change, %			
Binge drinking frequency (past month)									
Baseline	2.69 (2.22 to 3.15)	—	—	2.10 (1.81 to 2.39)	—	—	—	—	—
After 3 months	1.02 (0.77 to 1.27)	-1.36 (-1.81 to -0.91)**	-62.1	1.07 (0.80 to 1.34)	-1.29 (-1.77 to -0.81)**	-49.0	-0.11 (-0.49 to 0.70)	0.653	0.19
After 6 months	1.21 (0.91 to 1.51)	-1.13 (-1.70 to -0.86)**	-55.0	1.15 (0.94 to 1.35)	-1.25 (-1.81 to -0.70)**	-45.2	0.03 (-0.56 to 0.62)	0.721	0.06
Number of alcohol drinks at a typical occasion									
Baseline	6.69 (6.09 to 7.28)	—	—	6.32 (5.58 to 7.06)	—	—	—	—	—
After 3 months	4.18 (3.51 to 4.84)	-2.24 (-3.18 to -1.29)**	-37.5	4.65 (4.08 to 5.23)	-1.34 (-2.54 to -0.14)*	-26.4	-0.88 (-0.55 to 2.31)	0.345	0.27
After 6 months	4.45 (3.92 to 4.96)	-1.86 (-2.85 to -0.86)**	-33.5	4.57 (4.09 to 5.05)	-1.61 (-2.88 to -0.35)**	-27.7	-0.20 (-1.23 to 1.63)	0.756	0.20
Alcohol-related problems (RAP)									
Baseline	11.26 (10.04 to 12.48)	—	—	9.72 (8.68 to 10.76)	—	—	—	—	—
After 3 months	4.45 (3.65 to 5.25)	-6.72 (-7.68 to -5.76)**	-60.5	4.05 (3.36 to 4.74)	-6.43 (-7.37 to -5.49)**	-58.3	-0.29 (-0.95 to 1.54)	0.673	0.07
After 6 months	3.75 (3.11 to 4.39)	-6.87 (-7.81 to -5.93)**	-66.7	3.32 (2.77 to 3.87)	-7.05 (-7.92 to -6.18)**	-65.8	-0.24 (-1.48 to 1.01)	0.778	0.12

Primary outcomes based on linear mixed-effects analysis of covariance with baseline adjustment and multiple imputation (10 imputations), intervention group as fixed effect, participant, cluster, and counselor as random effects. Effect size = Cohen's d, which were calculated for each outcome by dividing the difference in mean change between intervention groups by the pooled baseline SD.

b-MI = brief motivational intervention; TAU = treatment as usual.
*p < 0.01, **p < 0.001.

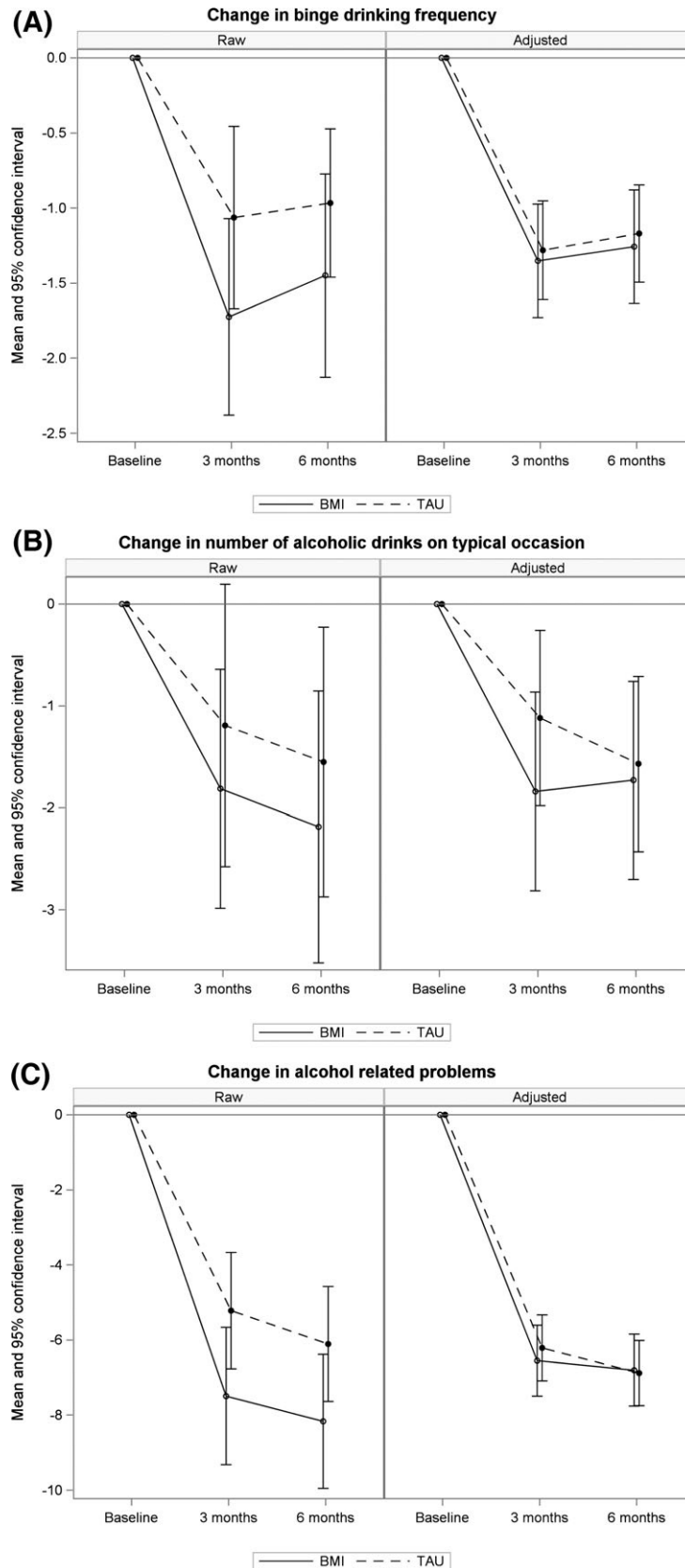


Figure 2. (A) Change in binge drinking frequency. Means are shown as raw means and adjusted for random effects (cluster, counselor) and repeated effect (time). (B) Change in number of alcoholic drinks at a typical occasion. Means are shown as raw means and adjusted for random effects (cluster, counselor) and repeated effect (time). (C) Change in alcohol-related problems. Means are shown as raw means and adjusted for random effects (cluster, counselor) and repeated effect (time). b-MI = brief motivational intervention; TAU = treatment as usual.

Table 3
Differences in Proportions of Participants reporting Service Utilization and Hospital Reattendance by Study Arm at 3- and 6-month Follow-up

Outcomes	b-MI Group (n = 141)*	TAU Group (n = 175)*	Between-group Differences (b-MI vs. TAU)		
			Δ% (95% CI)	p-value	OR (95% CI)
Service utilization after 3 months	39 (27.9%)	45 (25.5%)	2.40 (−8.45 to 13.3)	0.565	1.20 (0.65 to 2.21)
Service utilization after 6 months	26 (18.1%)	27 (15.1%)	2.94 (−6.23 to 12.1)	0.617	1.22 (0.56 to 2.65)

Secondary analyses on service utilization and hospital reattendance for AAI are based on mixed logistic regression with group as fixed effect, cluster and counselor as random effects, and multiple imputation (10 imputations). An OR of >1 indicates that the b-MI group was more likely to respond with “yes” than the TAU group; an OR of <1 indicates the opposite.
AAI = acute alcohol intoxication; b-MI = brief motivational intervention; TAU = treatment as usual.
*Data are reported as n (%).

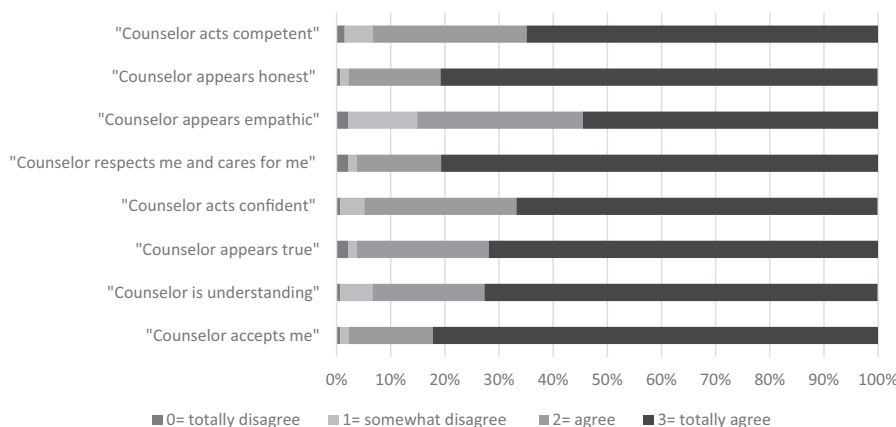


Figure 3. Patient ratings of counselor’s empathy, affirmation, competence, and congruency. Note: 141 patients, eight counselors. High agreement indicates intervention delivery was according to MI principles.

high-priority group for preventive health services in Germany^{11,12} and the alcohol-related PED visit is considered a window for opportunity to reach adolescents for interventions and preventive measures for long-term problems.²¹

Previous studies that involve b-MIs in ED settings typically apply screening methods to identify eligible patients for brief intervention among all PED patients, irrespective of whether the ED visit was preceded by an alcohol-related event such as injury or acute intoxication.^{44,51,52} Taken together these studies find modest effects of brief interventions among young people screening positive for risky drinking with regard to drinking, related problems, and referral to further health services.^{14,17,44,53} Although our study sets the focus on adolescents admitted for alcohol intoxication, thus a subsample of patients addressed in previous studies the central finding that youth across both trial conditions reduced their alcohol use and/or related problems significantly is consistent with previous findings of no effects on outcomes beyond the common improvement in both groups over time.^{21,25,26}

One main implication of current literature reviews of ED-based alcohol interventions^{14,44,51,52} is that generalization of findings is limited by substantial heterogeneity across studies and populations. Importantly, heterogeneity of ED-based intervention effects among young people has been attributed to individual differences in severity of baseline drinking and associated problems, as well as salient perceptions of alcohol as a major reason that has caused the ED visit. For example, prior studies^{27,54} found significant effects only among those patients who attributed their ED visit to their alcohol use, which led to our hypothesis of improved outcomes due to the specific timing and context of the present study (i.e., alcohol intoxication directly caused the PED visit).

Inherent to this reasoning is the presence of a TM, a popular concept that describes a “window of opportunity”⁵⁵ (p. 29) for health- and alcohol-related intervention. The mechanism of action underlying this concept has been considered to be created by a motivating clinician–patient interaction in the hospital context.²⁴ However, our finding of improvements in both

trial conditions suggests that the negative experience of AAI and the associated PED visit; thus the health-related event in itself has motivated drinking-related behavior change.^{56,57} In other words the AAI possibly functioned as a cueing event that may have overridden the impact of the relatively low-intensity brief intervention, at least for the follow-up periods covered in this study. Support for this interpretation is provided by one study in the Netherlands,¹³ showing that about half of the adolescents admitted for alcohol intoxication stopped drinking almost completely in the first 2 months after discharge without any intervention having occurred. Notably, interpretations of TM as heightened intervention responsiveness and as a cueing event for behavior change can both be derived from the current literature.^{24,56} If the AAI-based PED visit indeed functioned as a cueing event for behavior change, this could imply that even if our b-MI was not effective in the current study, it is possibly effective in other populations or other settings that do not include strong natural inducements for health-related behavior change. Unfortunately, the current literature is largely conceptual and lacks empirical or experimental attention. Clearly there is a need to study possible associations between cueing events and intervention outcomes for an advanced understanding of the impact these processes may have on prompting behavior change.

Other reasons also need consideration to explain the lack of significant findings. Of importance is the rather small contrast between both trial conditions in our study.⁴¹ Effects of MI interventions in young ED populations are typically small and tend to be non-significant in RCTs with active control group designs that use information brochures and contact information for community resources similar to the TAU group in this study.⁴⁴ Additionally, assessment reactivity is of important concern in explaining brief intervention effectiveness^{21,58,59} as assessment of health-related data often resembles elements of the clinician-patient interaction in brief interventions. Whether the above-described considerations around the teachable moment concept have played an additional role in assessment reactivity remains a speculation in this study, but the present results may again underscore the need for more research on the dynamics of this concept in the realm of brief alcohol interventions.

Notwithstanding the nonsignificant trial results, from an implementation perspective^{31,33} it is important to note acceptability and feasibility of intervention

delivery by external counselors in an urban PED context, which is designed for fast, often intense and expensive care and long-term prevention or health promotion activities are usually not prioritized.^{60,61} Refusal rates of eligible patients to participate in this study was low, and the mobile intervention delivery team was able to ensure privacy and confidentiality as well as MI principles during interviews in a potentially stressful situation with patients, PED staff, and accompanying parents.

Despite these favorable conditions, reliance on external counselors results in additional health service costs and needs to be justified by convincing evidence. Given the limited results of this study and the mixed evidence for brief intervention programs in acute health care settings so far, more research is clearly needed to strengthen brief intervention programs and to improve individual and public health outcomes regarding risky drinking and other maladaptive behaviors. While brief interventions based on MI are at least as effective as other brief intervention models regarding alcohol use for young populations in emergency care and beyond,^{17,44} there are currently only few alternative intervention models for the time-limited ED context available and studies directly comparing different intervention approaches are largely missing. We are aware of only one trial that compares brief MI with brief interventions targeting personality-specific risk factors with results on the way.⁶²

With regard to Germany, work around the established HaLT-Hart am LimiT intervention model is currently directed at individualizing the intervention approach through identification of differential treatment demands and referral to appropriate community services.⁶³ This approach acknowledges heterogeneity in alcohol misuse, psychosocial problems, and developmental risks in the patient population.^{11,64} However, given the limited postenrollment service utilization rate found in this study, lower threshold access to health services should be developed.

One promising strategy toward this aim, and for increasing the effectiveness of interventions in general, may be the utilization of Web and smartphone technology, which is currently developing at a fast pace.⁶⁵⁻⁶⁷ Future research should examine the usefulness of incorporating credible and effective technology-based supplements to in-person interventions, for example, to prolong the contact with patients after the initial encounter or to even replace in-person intervention

delivery by stand-alone computer-based b-MI versions, which can be equally as effective.⁵³

LIMITATIONS

Several limitations need to be noted. First, due to limited resources we restricted enrollment to weekends (Friday to Sunday) and to selected hospitals. However, weekends are the peak time for AAI³⁶ and our results should be generalizable to the entire city as there were few exclusion criteria; treatment recordings for citywide AAI during the enrollment period³⁵ indicate that we were able to reach a majority of patients.

Second, we have not included an objective measure for assessing intervention fidelity, such as the Motivational Interviewing Treatment Integrity (MITI) scale.⁶⁸ Instead, a self-report for rating counselors' MI-related competencies was applied as a patient-oriented measure for perceived MI spirit. Moreover, training and supervision of counselors were moderate compared to more formal and intense brief intervention models in ED settings tested in several prior studies.^{21,69} However, given the role of external validity considerations in this effectiveness trial³¹ and an apparent lack of high intensity training and supervision structures for counselors in the national HaLT project, counselor training was conceptualized in a way that implementation in nonresearch settings would be feasible.

Third, we cannot rule out that assessment reactivity, research participation effects, and/or regression to the mean had an impact on the results, thereby confounding intervention effects.⁵⁹ If such influences have indeed occurred, this study could be interpreted as an underestimation of b-MI effects.⁴¹

Fourth, participants were not blinded to the assigned trial conditions and underreporting of alcohol use may have been an issue,⁷⁰ although interviews were conducted in confidentiality and in a nonjudgmental and nonconfronting way. Fifth, enrollment of parents in this study was moderate at most, which may limit the conclusions. Moreover, while adding family components is considered useful,⁷¹ introduction of the parents or other authority figures after alcohol-related hospitalization may hold the potential for confusing "ownership" of the adolescents' drinking²⁰ (p. 65), which could compromise central tenets of MI such as acceptance and avoiding confrontation.¹⁸

Sixth, the study only employed a follow-up at 6 months, whereas a previous study reported significant effects after 12 months that were not present at

the 6-month follow-up.⁵³ However, and in contrast to our findings, the same study also found significant effects at the 3-month follow-up. Given that effects of b-MIs usually decrease with time^{17,44} longer follow-up intervals in our study thus may not have resulted in different results.

Finally, precision of intervention effects is largely dependent on measurement accuracy.⁷² Future studies should consider using mobile technology to collect follow-up outcome measurements in ecologically valid situations (i.e., by means of ecological momentary assessment).

CONCLUSIONS

This randomized-controlled study is the first to examine brief motivational intervention effects among adolescents following acute alcohol intoxication, and strengthens the knowledge base for this relevant patient population. Over time, reported binge drinking episodes, numbers of alcoholic drinks at a typical occasions, and alcohol-related problems decreased significantly in both trial conditions alike. However, there is no evidence that these reductions were positively influenced by the intervention. Additionally there was no evidence for increased postenrollment service utilization in this study. Notwithstanding these limitations, the study adds evidence that the time-limited patient contact during the pediatric ED offers an opportunity for reaching youth with alcohol misuse, a population that is otherwise hard to reach through available service and treatment programs. Future research should further examine the potentials of brief motivational interventions in different patient populations, including adolescents admitted for acute alcohol intoxication; focus on an advanced understanding of the "teachable moment" concept in this context; and explore feasible ways to improve outcomes.

The authors thank Udo Kuestner and Katrin Lamers for their contribution to the intervention manual and training, Prof. K. Wegscheider for methodologic advice, and all counselors and research assistants for their contribution and commitment.

References

1. World Health Organization. Global Status Report on Alcohol and Health. 2014. Available from: http://apps.who.int/iris/bitstream/10665/112736/1/9789240692763_eng.pdf?ua=1. Accessed Jun 10, 2016.

2. Rehm J, Shield KD, Rehm MX, Gmel G, Frick U. Alcohol Consumption, Alcohol Dependence and Attributable Burden of Disease in Europe: Potential Gains from Effective Interventions for Alcohol Dependence. Centre for Addiction and Mental Health. 2012. Available at: http://amphoraproject.net/w2box/data/AMPHORA%20Reports/CAMH_Alcohol_Report_Europe_2012.pdf. Accessed Jun 8, 2016.
3. Currie C, Roberts C, Morgan A, et al. Young people's health in context: Health Behaviour in School-aged Children (HBSC) Study: International Report from the 2001/2003 Survey (Health Policy for Children and Adolescents, No. 4). Copenhagen, Denmark: World Health Organization, 2004. http://www.who.int/immunization/hpv/target/young_peoples_health_in_context_who_2011_2012.pdf. Accessed June 20, 2016.
4. Lampert T, Kuntz B; KIGGS Study Group. Tobacco and alcohol consumption among 11- to 17-year-old adolescents. Results of the KiGGS study: first follow-up (KiGGS Wave 1). *Bundesgesundheitsbl* 2014;57:830–9.
5. Johnston LD, O'Malley PM, Miech RA, Bachman JG, Schulenberg JE. Monitoring the Future National Results on Drug Use 1975–2013: 2013 Overview, Key Findings on Adolescent Drug Use. Ann Arbor, MI: Institute for Social Research, 2014. Available at: <http://www.monitoringthefuture.org/pubs/monographs/mtf-overview2013.pdf>. Accessed February 10, 2016.
6. Hibell B, Guttormson U, Ahlström S, et al. The 2011 ESPAD Report. Substance Use Among Students in 36 European Countries. The Swedish Council for Information on Alcohol and Drugs (CAN). 2012. Available at: http://www.can.se/contentassets/8d8cb78bbd28493b9030c65c598e3301/the_2011_espad_report_full.pdf. Accessed Mar 10, 2016.
7. Pharo H, Sim C, Graham M, Gross J, Hayne H. Risky business: executive function, personality, and reckless behavior during adolescence and emerging adulthood. *Behav Neurosci* 2011;125:970–8.
8. Miller JW, Naimi TS, Brewer RD, Jones SE. Binge drinking and associated health risk behaviors among high school students. *Pediatrics* 2007;119:76–85.
9. Orth B, Töppich J. [Alcohol Consumption of Adolescents and Young Adults in Germany 2014. Results of a Representative Survey and Trends]. Köln, Germany: Federal Centre for Health Education (BZgA), 2015. Available at: http://www.slsev.de/fileadmin/user/Dokumente/Fachinformationen/Alkoholsurvey_2014_Bericht_Alkohol_Ergebnisse.pdf. Accessed Feb 20, 2016.
10. Patients Discharged from Hospital after Inpatient Treatment (Including Deaths and Hour Cases) 2005 to 2014 F10.0 - Psychic and Behavior Disorders by Alcohol Acute Alcohol Intoxication. Wiesbaden, Germany: Federal Statistical Office. Available at: <https://www.destatis.de/EN/FactsFigures/SocietyState/Health/Hospitals/Tables/DiagnosisAlcoholAgYears.html>. Accessed Mar 16, 2016.
11. Gross C, Kraus L, Piontek D, Reis O, Zimmermann US. Prediction of long-term outcomes in young adults with a history of adolescent alcohol-related hospitalization. *Alcohol* 2016;51:47–53.
12. Kraus L, Hannemann TV, Pabst A, et al. [Inpatient Treatment of Adolescents with Acute Alcohol Intoxication: The Tip of the Iceberg?]. *Gesundheitswesen* 2012;75:456–64.
13. de Visser M, van der Lely N, van Zanten E. Behavior change after alcohol intoxication in adolescents. *Addict Sci Clin Pract* 2013;8:A81–A.
14. Diestelkamp S, Drechsel M, Baldus C, Wartberg L, Arnaud N, Thomasius R. Brief in person interventions for adolescents and young adults following alcohol-related events in emergency care: a systematic review and European evidence synthesis. *Eur Addict Res* 2016;22:17–35.
15. Federal Ministry of Health (BMG). [Scientific Evaluation of the German model project “HaLT - Hart am Limit”, scientific report]. Available at: <https://www.bundesgesundheitsministerium.de/uploads/publications/HaLT-Abschlussbericht-25-10-2010.pdf>. Accessed Jan 15, 2016.
16. Mitchell SG, Gryczynski J, O'Grady KE, Schwartz RP. SBIRT for adolescent drug and alcohol use: current status and future directions. *J Subst Abuse Treat* 2013;44:463–72.
17. Tanner-Smith EE, Lipsey MW. Brief alcohol interventions for adolescents and young adults: a systematic review and meta-analysis. *J Subst Abuse Treat* 2015;51:1–18.
18. Miller WR, Rollnick S. *Motivational Interviewing: Helping People Change*. 3rd ed. New York: The Guilford Press, 2013.
19. D'Amico EJ, Hunter SB, Miles JN, Ewing BA, Osilla KC. A randomized controlled trial of a group motivational interviewing intervention for adolescents with a first time alcohol or drug offense. *J Subst Abuse Treat* 2013;45:400–8.
20. Tevyaw TO, Monti PM. Motivational enhancement and other brief interventions for adolescent substance abuse: foundations, applications and evaluations. *Addiction* 2004;99:63–75.
21. Bernstein J, Heeren T, Edward E, et al. A brief motivational interview in a pediatric emergency department, plus 10-day telephone follow-up, increases attempts to quit drinking among youth and young adults who screen positive for problematic drinking. *Acad Emerg Med* 2010;17:890–902.
22. Linakis JG, Bromberg J, Baird J, et al. Feasibility and acceptability of a pediatric emergency department alcohol prevention intervention for young adolescents. *Pediatr Emerg Care* 2013;29:1180–8.
23. Roper L, McGuire J, Salmon P, Booth PG. Treatment-seeking for alcohol problems: the influence of mirroring

- events and windows of opportunity. *Addict Res Theory* 2013;21:479–88.
24. Lawson PJ, Flocke SA. Teachable moments for health behavior change: a concept analysis. *Patient Educ Couns* 2009;76:25–30.
 25. Spirito A, Monti PM, Barnett NP, et al. A randomized clinical trial of a brief motivational intervention for alcohol-positive adolescents treated in an emergency department. *J Pediatr* 2004;145:396–402.
 26. Monti PM, Colby SM, Barnett NP, et al. Brief intervention for harm reduction with alcohol-positive older adolescents in a hospital emergency department. *J Consult Clin Psychol* 1999;67:989–94.
 27. Monti PM, Barnett NP, Colby SM, et al. Motivational interviewing versus feedback only in emergency care for young adult problem drinking. *Addiction* 2007;102:1234–43.
 28. Becker SJ, Spirito A, Hernandez L, et al. Trajectories of adolescent alcohol use after brief treatment in an emergency department. *Drug Alcohol Depend* 2012;125:103–9.
 29. Newton AS, Dong K, Mabood N, et al. Brief emergency department interventions for youth who use alcohol and other drugs: a systematic review. *Pediatr Emerg Care* 2013;29:673–84.
 30. Field CA, Baird J, Saitz R, Caetano R, Monti PM. The mixed evidence for brief intervention in emergency departments, trauma care centers and inpatient hospital settings: what should we do? *Alcohol Clin Exp Res* 2010;34:2004–10.
 31. Arnaud N, Diestelkamp S, Wartberg L, et al. [Sustainable transfer of the health network alcohol use in adolescence: a cooperation of research, practice and politics]. *Psychiatr Prax* 2015;42:35–8.
 32. Mason WA, Fleming CB, Thompson RW, Haggerty KP, Snyder JJ. A framework for testing and promoting expanded dissemination of promising preventive interventions that are being implemented in community settings. *Prev Sci* 2014;15:674–83.
 33. Härter M, Kentgens M, Brandes A, et al. Rationale and content of psychenet: the Hamburg Network for Mental Health. *Eur Arch Psychiatry Clin Neurosci* 2012;262:57–63.
 34. Diestelkamp S, Arnaud N, Sack PM, Wartberg L, Daubmann A, Thomasius R. Brief motivational intervention for adolescents treated in emergency departments for acute alcohol intoxication - a randomized-controlled trial. *BMC Emerg Med* 2014;14:13.
 35. Statistical Office Hamburg and Schleswig-Holstein (Statistikamt Nord). Inpatient treatment in hospitals in Hamburg, Germany 2006 to 2013 F10.0 - Psychic and behavior disorders by alcohol acute alcohol intoxication. Hamburg, 2015.
 36. Stolle M, Sack PM, Spieles H, Thomasius R. Acute ethanol intoxication among children and adolescents in Hamburg, Germany. *Bundesgesundheitsbl* 2010;53:910–6.
 37. Sack PM, Diestelkamp S, Küstner UJ, Thomasius R. [Health Network “Alcohol Abuse in Adolescence”: Improved Access-to-Care for Children and Adolescents with At-Risk Alcohol Use]. *Suchttherapie* 2012;13:33–6.
 38. Tossmann P, Kasten L, Lang P, Struber E. [Determination of the concurrent validity of the CRAFT-d - a screening instrument for problematic alcohol consumption]. *Z Kinder Jugendpsychiatr Psychother* 2009;37:451–9.
 39. Goldbeck L, Besier T, Petermann F, Karpinski N, Hampel P. [Validity of the German version of the Reynolds Adolescent Adjustment Screening Inventory in a clinical sample]. *Z Psychiatr Psychol Psychother* 2007;55:263–70.
 40. Earleywine M, LaBrie JW, Pedersen ER. A brief Rutgers Alcohol Problem Index with less potential for bias. *Addict Behav* 2008;33:1249–53.
 41. Kypri K. Methodological issues in alcohol screening and brief intervention research. *Subst Abuse* 2007;28:31–42.
 42. Stucki C. [Creating differential therapeutic alliances. Intuitive reactions, patient perception and therapeutic alliance in psychotherapy]. University of Bern, Switzerland, 2004. Available at: http://www.zb.unibe.ch/download/eldiss/04stucki_c.pdf. Accessed Apr 12, 2016.
 43. Reis O, Pape M, Häßler F. [Evaluation of a project for the prevention of adolescent binge-drinking]. *SUCHT* 2009;55:347–56.
 44. Kohler S, Hofmann A. Can motivational interviewing in emergency care reduce alcohol consumption in young people? A systematic review and meta-analysis. *Alcohol* 2015;50:107–17.
 45. Hettema J, Steele J, Miller WR. Motivational interviewing. *Annu Rev Clin Psychol* 2005;1:91–111.
 46. Kliche T, Post M, Pfitzner R, et al. [Knowledge transfer methods in German disease prevention and health promotion. A survey of experts in the federal prevention research program]. *Gesundheitswesen* 2012;74:240–9.
 47. Campbell MK, Piaggio G, Elbourne DR, Altman DG. Consort 2010 statement: extension to cluster randomised trials. *BMJ* 2012;345:e5661.
 48. van Buuren S. Multiple imputation of discrete and continuous data by fully conditional specification. *Stat Methods in Med Res* 2007;16:219–42.
 49. Apodaca TR, Longabaugh R. Mechanisms of change in motivational interviewing: a review and preliminary evaluation of the evidence. *Addiction* 2009;104:705–15.
 50. Tait RJ, Hulse GK, Robertson SI, Sprivilis PC. Emergency department-based intervention with adolescent substance users: 12-month outcomes. *Drug Alcohol Depend* 2005;79:359–63.
 51. Wachtel T, Staniford M. The effectiveness of brief interventions in the clinical setting in reducing alcohol misuse

- and binge drinking in adolescents: a critical review of the literature. *J Clin Nursing* 2010;19:605–20.
52. Yuma-Guerrero PJ, Lawson KA, Velasquez MM, von Sternberg K, Maxson T, Garcia N. Screening, brief intervention, and referral for alcohol use in adolescents: a systematic review. *Pediatrics* 2012;130:115–22.
 53. Cunningham RM, Chermack ST, Ehrlich PF, et al. Alcohol interventions among underage drinkers in the ED: a randomized controlled trial. *Pediatrics* 2015;136:e783–93.
 54. Walton MA, Goldstein AL, Chermack ST, et al. Brief alcohol intervention in the emergency department: moderators of effectiveness. *J Studies Alcohol Drugs* 2008;69:550–60.
 55. Glasgow RE, Stevens VJ, Vogt TM, Mullooly JP, Lichtenstein E. Changes in smoking associated with hospitalization: quit rates, predictive variables, and intervention implications. *Am J Health Promot* 1991;6:24–9.
 56. Boudreaux ED, Bock B, O’Hea E. When an event sparks behavior change: an introduction to the sentinel event method of dynamic model building and its application to emergency medicine. *Acad Emerg Med* 2012;19:329–35.
 57. Longabaugh R, Minugh PA, Nirenberg TD, Clifford PR, Becker B, Woolard R. Injury as a motivator to reduce drinking. *Acad Emerg Med* 1995;2:817–25.
 58. Heather N. Interpreting null findings from trials of alcohol brief interventions. *Front Psychiatry* 2014;5:1–11.
 59. Jenkins RJ, McAlaney J, McCambridge J. Change over time in alcohol consumption in control groups in brief intervention studies: systematic review and meta-regression study. *Drug Alcohol Depend* 2009;100:107–14.
 60. Woolard R, Cherpitel C, Kathleen T. Brief intervention for emergency department patients with alcohol misuse: implications for current practice. *Alcohol Treat Q* 2011;29:146–57.
 61. Johnson M, Jackson R, Guillaume L, Meier P, Goyder E. Barriers and facilitators to implementing screening and brief intervention for alcohol misuse: a systematic review of qualitative evidence. *J Public Health (Oxf)* 2011;33:412–21.
 62. Hides L, Kavanagh DJ, Daglish M, et al. The Quik Fix study: a randomised controlled trial of brief interventions for young people with alcohol-related injuries and illnesses accessing emergency department and crisis support care. *BMC Emerg Med* 2014;14:19.
 63. Kuttler H, Schwendemann H, Bitzer EM. Familial risk and protective factors in alcohol intoxicated adolescents: psychometric evaluation of the family domain of the Communities That Care Youth Survey (CTC) and a new short version of the Childhood Trauma Questionnaire (CTQ). *BMC Pediatr* 2015;15:191.
 64. Diestelkamp S, Kriston L, Arnaud N, et al. Drinking patterns of alcohol intoxicated adolescents in the emergency department: a latent class analysis. *Addict Behav* 2015;50:51–9.
 65. Kypri K, McCambridge J, Cunningham JA, et al. Web-based alcohol screening and brief intervention for Maori and non-Maori: the New Zealand e-SBINZ trials. *BMC Public Health* 2010;10:781.
 66. Deluca P, Coulton S, Alam MF, et al. Linked randomised controlled trials of face-to-face and electronic brief intervention methods to prevent alcohol related harm in young people aged 14–17 years presenting to emergency departments (SIPS junior). *BMC Public Health* 2015;15:345.
 67. Shingleton RM, Palfai TP. Technology-delivered adaptations of motivational interviewing for health-related behaviors: a systematic review of the current research. *Patient Educ Couns* 2016;99:17–35.
 68. Moyers TB, Martin T, Manuel JK, Hendrickson SM, Miller WR. Assessing competence in the use of motivational interviewing. *J Subst Abuse Treat* 2005;28:19–26.
 69. Rhodes KV, Rodgers M, Sommers M, et al. Brief motivational intervention for intimate partner violence and heavy drinking in the emergency department: a randomized clinical trial. *JAMA* 2015;314:466–77.
 70. Babor TF, Steinberg K, Anton R, Del Boca F. Talk is cheap: measuring drinking outcomes in clinical trials. *J Stud Alcohol* 2000;61:55–63.
 71. Spirito A, Sindelar-Manning H, Colby SM, et al. Individual and family motivational interventions for alcohol-positive adolescents treated in an emergency department: results of a randomized clinical trial. *Arch Pediatr Adolesc Med* 2011;165:269–74.
 72. Voogt C, Kuntsche E, Kleinjan M, Poelen E, Engels R. Using ecological momentary assessment to test the effectiveness of a web-based brief alcohol intervention over time among heavy-drinking students: randomized controlled trial. *J Med Internet Res* 2014;16:e5.

Supporting Information

The following supporting information is available in the online version of this paper:

Data Supplement S1. Flowchart of the brief motivational intervention (b-MI).

Data Supplement S2. Intercorrelations among study variables.

Data Supplement S3. Changes in primary outcomes by study arm to baseline versus 3- and 6-month follow-up adjusted for potential confounders.

Publication V. Drinking patterns of alcohol intoxicated adolescents in the emergency department: a latent class analysis

Reference. Diestelkamp, S., Kriston, L., Arnaud, N., Wartberg, L., Sack, P.-M., Härter, M., & Thomasius, R. (2015). Drinking patterns of alcohol intoxicated adolescents in the emergency department: a latent class analysis. *Addictive Behaviors*, 50, 51-59.

Format. published article



Drinking patterns of alcohol intoxicated adolescents in the emergency department: A latent class analysis



Silke Diestelkamp^{a,*}, Levente Kriston^b, Nicolas Arnaud^a, Lutz Wartberg^a, Peter-Michael Sack^a, Martin Härter^b, Rainer Thomasius^a

^a German Center for Addiction Research in Childhood and Adolescence, University Medical Center Hamburg-Eppendorf, D-20246 Hamburg, Germany

^b Department of Medical Psychology, University Medical Center Hamburg-Eppendorf, D-20246 Hamburg, Germany

HIGHLIGHTS

- We examined drinking patterns in adolescents treated for alcohol intoxication
- Latent class analysis revealed 5 classes with distinct drinking patterns
- 1 low-risk class, 2 risky drinking classes and 2 high-risk classes were identified
- High-risk drinking was associated with most severe psychosocial problems
- Findings may help practitioners to better target interventions to patients' needs

ARTICLE INFO

Available online 11 June 2015

Keywords:

Adolescent
Alcohol intoxication
Drinking pattern
Risk factor
Emergency department
Latent class analysis

ABSTRACT

Introduction: The increasing number of children and adolescents in need of emergency medical treatment following acute alcohol intoxication has been a major public health concern in Europe in recent years. However, little is known about drinking habits and associated risks in this population. To our knowledge, this is the first study to examine drinking patterns and associated risks in adolescent emergency department patients following alcohol intoxication. The aim of this study is to establish a classification system for admitted adolescents

Methods: Latent class analysis was used to identify subgroups of adolescents with distinct patterns of habitual drinking as defined by the quantity of consumed alcohol on a typical drinking occasion, frequency of binge drinking and drunkenness, alcohol-related problems, prior alcohol-related hospitalizations and alcohol-related risk behaviors. Subgroup characteristics were examined with regard to sociodemographics, other substance use and psychosocial problems using analysis of variance (ANOVA) and chi-square tests.

Results: A total of 316 adolescents aged 12–17 treated in 6 urban emergency departments in Germany were analyzed. Five classes of drinking patterns were identified: one class representing low-risk drinking (class 1 “low-risk” (61.2%)), two classes representing risky drinking (class 2 “moderate-risk” (5.7%) and class 3 “frequent drunk” (15.8%)), as well as two classes representing high-risk drinking (class 4 “alcohol-related problems” (11.4%) and class 5 “excessive drinking” (5.1%)). Membership of classes 4 and 5 was associated with the most severe psychosocial problems, especially with regard to aggressive-dissocial behaviors. The CRAFFT-d and brief RAPI screening tools allowed identifying the two risky drinking classes and two high-risk drinking classes.

Conclusions: Our findings provide the first in-depth analysis of habitual drinking in this study population and may help practitioners to better tailor interventions to patients' needs by using the identified classes as a form of classification system for admitted adolescents.

© 2015 Elsevier Ltd. All rights reserved.

Abbreviations: AAI, Acute alcohol intoxication; BI, Brief intervention; ED, Emergency department; LCA, Latent class analysis; AIC, Akaike Information Criterion; BIC, Bayesian Information Criterion.

* Corresponding author at: German Center for Addiction Research in Childhood and Adolescence, W29, Center for Psychosocial Medicine, University Medical Center Hamburg-Eppendorf, Martinistraße 52, D-20246 Hamburg, Germany. Tel.: +49 40 7410 58051; fax: +49 40 7410 56571.

E-mail addresses: s.diestelkamp@uke.de (S. Diestelkamp), lkriston@uke.de (L. Kriston), n.arnaud@uke.de (N. Arnaud), lwartber@uke.de (L. Wartberg), psack@uke.de (P.-M. Sack), m.haerter@uke.de (M. Härter), thomasius@uke.de (R. Thomasius).

1. Introduction

Heavy episodic underage drinking is a growing public health concern in many European countries. Episodes of heavy drinking, i.e. consumption of 5 (4 for girls) or more standard drinks (defined as .36 liters of beer or .12 liters of wine or .037 liters of liquor) on one occasion (binge drinking) (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994) in the past 30 days are reported by 39% of 15–16-year-old students in Europe (Hibell et al., 2012). Underage binge drinking is associated with an increased risk of violent behaviors (Swahn, Simon, Hammig, & Guerrero, 2004), victimization (Shepherd, Sutherland, & Newcombe, 2006), injuries (Sindelar, Barnett, & Spirito, 2004), and unwanted or regretted sexual activities (Champion et al., 2004). Repeated binge drinking episodes are associated with an increased risk of developing an alcohol-related disorder later in life (Viner & Taylor, 2007). Recently, rising numbers of adolescents in need of emergency medical treatment due to acute alcohol intoxication (AAI) have attracted public attention in a number of European countries (Bitunjac & Saraga, 2009; Gesundheitsberichterstattung des Bundes: Diagnosedaten der Krankenhäuser ab, 2014; Healey, Rahmana, Faizal, & Kinderman, 2014; Kuzelová et al., 2009; Loukova, 2011; Van Hoof, Van Der Lely, Bouthoorn, Van Dalen, & Pereira, 2011).

Whether the rising numbers of AAI treatment reflect an increase in risky drinking has been the subject of much debate (Fandler, Scheer, Rödl, & Müller, 2008; Kraus et al., 2012). Recent research has found that (a) an emergency department (ED) admission due to an AAI is not unconditionally implying frequent excessive drinking (Kraus et al., 2012) and (b) higher public awareness of risks associated with underage drinking is associated with higher numbers of ED admissions (Wurdak et al., 2013). However, little is known about habitual drinking of adolescent AAI patients and characteristics of potential subgroups. Therefore, the aim of this study was to close this gap in current research by examining subgroups with distinct habitual drinking patterns in an underage sample of AAI patients in ED.

Previous efforts of measuring risky underage drinking found approaches solely applying quantity and frequency measures to fail in identifying adolescents who experience negative consequences of their alcohol use. Ellickson, McGuigan, Adams, Bell, and Hays (1996) found in their study with 4390 high school students that high alcohol consumption only identifies half of the students labeled as “at-risk misusers” and conclude that teenage alcohol misuse needs to include the three dimensions: “high-risk drinking,” “alcohol-related problems,” and “high consumption.” Furthermore, regular alcohol use was found to be less common in adolescents (Deas, Riggs, Langenbucher, Goldman, & Brown, 2000; Wechsler, Kuo, Lee, & Dowdall, 2000) and to be not useful for identification of risky drinkers in this age group (Reboussin, Song, Shrestha, Lohman, & Wolfson, 2006). In general, measures commonly used to identify adult alcohol misuse such as one-dimensional quantity and frequency measures were found not to be applicable for adolescent populations, because adolescent problem drinking is better captured by drinking patterns (Ellickson et al., 1996; Townshend & Duka, 2002). One characteristic pattern is infrequent but heavy alcohol consumption, a pattern often observed among adolescents and identified as causing most alcohol-related harm (Sindelar et al., 2004; Viner & Taylor, 2007). A study by Kraus et al. (2012) found infrequent heavy drinking to be even more prevalent in adolescent AAI patients compared to adolescents in the general population. Therefore, we used a combination of indicators depicting quantity of drinking, frequency of heavy drinking, alcohol-related problems, and alcohol-related risk behaviors to capture underage drinking and to define subgroups.

Because isolated unidimensional measures were found to fail in capturing adolescent problem drinking (Ellickson et al., 1996; Stewart & Power, 2002; Townshend & Duka, 2002), we used latent class analysis (LCA) to identify subgroups with distinct drinking patterns (McCutcheon, 1987). Similar approaches have recently been used in a number of studies examining drinking patterns and associated

behaviors in college students (Beseler, Taylor, Kraemer, & Leeman, 2012; Chiauzzi, DasMahapatra, & Black, 2013; Ray, Stapleton, Turrissi, & Philion, 2012), an adolescent community sample (Reboussin et al., 2006) and adolescent patients presenting to a primary care health clinic (Bohnert et al., 2014). Chiauzzi et al. (2013) identified 4 classes of college students with varying degrees of risky drinking and drug use with one class (20.2%) representing high-risk drinking, one class (13.6%) representing moderate-risk drinking, and two classes (46.0% and 20.2%) representing low-risk drinking with varying degrees of drug use. Ray et al. (2012) identified three classes of risky student drinkers as defined by the use of drinking-related protective and risk behaviors. 30% of students exhibited high-risk behaviors (e.g. competitive drinking) combined with low protective behaviors (e.g. setting limits), 10% reported low-risk behaviors in combination with high protective behaviors, and the remaining 60% reported mixed drinking-related risk and protective behaviors. Drinking behaviors and alcohol-related problems were used by Reboussin et al. (2006) in order to identify classes of risky drinker in a community sample of 16–20 year olds. In this sample, 43% of adolescents were classified as “non-problem drinkers,” 30% as “risky problem drinkers” due to high prevalences of social problems from drinking and a high frequency of getting drunk, and 27% as “regular problem drinkers” due to very high prevalences of binge drinking and getting drunk as well as high prevalences of driving after drinking and social problems from drinking. A clinical sample of adolescents was recently assessed by Bohnert et al. (2014) with the focus on identifying classes with distinct patterns of polysubstance use. One class (10.9%) with highest probabilities of polysubstance use was also characterized by a high probability of heavy episodic drinking.

Beside the ability to identify underlying structures of variable endorsement, LCA has a number of methodological strengths including control of Type I error rates and high statistical power (Lanza & Rhoades, 2013). In the present study, we aimed at answering the following questions: (1) How many subgroups based on distinct habitual drinking patterns can be identified in our sample of underage AAI patients? (2) What percentages of the sample are represented in each subgroup? (3) What is the average endorsement of indicators of risky drinking in the subgroups? (4) Is subgroup membership associated with distinct endorsements of other risk factors? As risk factors, sociodemographic variables were examined first. Second, subgroups were compared regarding other substance use, where age at first use as a known risk factor for problem drinking was examined in particular (Clark, Cornelius, Kirisci, & Tarter, 2005; Grant, Stinson, & Harford, 2001), as were concurrent substance use and drug-related risk behaviors (Merline, Jager, & Schulenberg, 2008). Third, psychosocial problems were examined such as aggressive-dissocial behavior and anger-control problems which were found to be strongly correlated with risky substance use in adolescence (Iacono, Malone, & McGue, 2008; Schuckit, Smith, & Kalmijn, 2014), as were internalizing tendencies such as depression and self-esteem problems (Camatta & Nagoshi, 1995; Pardini, White, & Stouthamer-Loeber, 2007). We chose an exploratory approach to these research questions, because prior research with this patient population is limited and the generalizability of results of drinking pattern analyses in adolescent populations in other settings is questionable.

2. Method

2.1. Sample and procedures

Baseline data of participants of the HaLT-Hamburg trial were analyzed for the present study. The HaLT-Hamburg trial is a randomized-controlled trial evaluating the effectiveness of a brief intervention in ED for underage AAI patients. A detailed description of the recruitment and assessment procedures is provided by Diestelkamp et al. (2014). A total of 316 adolescents aged 12–17 years admitted to an ED for AAI took part in the study. All participants provided informed consent and procedures were approved by the ethics committee of the Chamber of

Table 1
Sample characteristics.

Characteristics		No.	%
Gender	Female	152	48
	Male	146	52
Age (years) Mean = 15.8 (SD 1.16)	12	7	2.2
	13	19	5.3
	14	53	16.8
	15	101	31.9
	16	90	28.5
	17	46	14.6
Migration background	Both parents born in another country	54	18.6
School status	Attending school	278	88.0
Substance use past 12-month	Tobacco	208	65.8
	Cannabis	104	32.9
	Ecstasy	13	4.1
Regular substance use past 12 months ^a	Tobacco	91	28.8
	Alcohol	66	20.9
	Cannabis	28	8.9
	Ecstasy	2	0.6

^a Note: Regular use defined as daily use for tobacco, at least weekly use for alcohol, and at least 10 times per year for cannabis and ecstasy (Bundeszentrale für gesundheitliche Aufklärung (BZgA), 2012).

Psychotherapists Hamburg. The trial is registered under Current Controlled Trials ISRCTN31234060. Table 1 provides an overview of the sample characteristics. Mean age of the sample was 15.8 (SD 1.16) with an almost balanced gender distribution (48% females). Average blood alcohol concentration (BAC) was 1.8‰ (SD 0.61; range 0.1‰–4.3‰) at the time of admission.

2.2. Measures

2.2.1. Indicator variables

Three sets of variables were used to assess underage drinking. The first set of variables represented alcohol consumption and comprised (1) number of standard drinks consumed on a typical drinking occasion, (2) frequency of subjective drunkenness in the past 3 months, and (3) past 30-day binge drinking frequency defined as consumption of 5 (4 for females) or more standard drinks on one drinking occasion (Wechsler et al., 1994). We defined a standard drink as 0.33 liter beer, 0.1 liter wine or 0.04 liter spirits (Bundeszentrale für gesundheitliche Aufklärung (BZgA), 2014). The second set of indicator variables represented alcohol-related problems and comprised (1) lifetime prevalence of previous alcohol-related hospitalizations and (2) a brief version of the Rutgers Alcohol Problem Index (brief RAPI) (Earleywine, LaBrie, & Pedersen, 2008) as a youth-specific screening measure for alcohol-related problems. Participants were asked 16 questions about the frequency of experiencing different situations in the past 3 months while they were drinking alcohol or as a result of their alcohol use (“Not able to do your homework or study for a test”; “Got into fights with other people (friends, relatives, strangers)”; “Wanted to stop drinking but you couldn’t”). Response options ranged from never to more than 10 times. Third, alcohol-related risk behaviors were assessed through the CRAFFT-d alcohol screening test in its validated German version (Tossmann, Kasten, Lang, & Stüber, 2009). This 6-item-questionnaire assesses alcohol-related risk behaviors applying a binary yes/no response format (“Do you ever use alcohol to relax, feel better about yourself, or fit in?”; “Do you ever use alcohol or drugs while you are by yourself?”). Two or more positive answers indicate risky alcohol use. All measures were based on self-reports.

2.2.2. Sociodemographic variables

We examined age, gender, school status, and migration background. Participants were considered to have a migration background if both father and mother were born in a country other than Germany.

2.2.3. Substance use

Age of first use of alcohol, nicotine, cannabis, and ecstasy was assessed. Frequency of use was assessed through number of days of substance use in the past 30 days. Additionally, we used the validated German version of the RAFFT drug use screening test (Laging, 2005) to assess risky drug use. This 6-item-questionnaire applies a yes/no response format. Two or more positive responses indicate risky drug use.

2.2.4. Psychosocial problems

Psychosocial problems were assessed with the Screening for Mental Disorders in Adolescence (Hampel & Petermann, 2005). It assesses externalizing tendencies through the subscales aggressive-dissocial behaviors and anger-control problems, and internalizing tendencies through the subscales anxiety/depression and self-esteem problems. This 32-item questionnaire was validated in a representative sample of German adolescents.

2.3. Statistical analysis

Latent class analysis (LCA) was applied to examine drinking patterns. In a first step, the model with the optimal number of latent classes was determined by examining model fit indices. The Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) inform about global model fit taking into account parsimony and goodness of fit. Likelihood ratio tests were used to test whether a given model fits the data better than the model with one class less. Entropy values indicate how well classes are separated with values >0.8 indicating good separation (Tein, Cox, & Cham, 2013). Model selection was based on fit indices as well as practical interpretability and research objective as recommended (Jung & Wickrama, 2008; Kriston et al., 2011; Muthén & Muthén, 2000). Models with 1 through 9 classes were tested using MPlus Version 5 (Muthén & Muthén, 2011). In a second step, means and standard deviations of continuous indicator variables were computed for each class. Indicator variables representing frequencies showed skewed distributions with high frequencies of the lowest value (“0”). Therefore, these variables were modeled as zero-inflated count variables using a zero-inflated Poisson model as frequently recommended for this kind of data (Affi, Kotlerman, Ettner, & Cowan, 2007; Atkins & Gallop, 2007; Gardner, Mulvey, & Shaw, 1995). Two statistics will be reported: (1) percentage of subjects not endorsing the lowest value (“at least one”), and (2) median and interquartile range (IQR) for the subgroup of subjects not endorsing the lowest value. In order to interpret the level of risk associated with a given indicator variable endorsement, we applied two risk references. First, we compared class means and prevalences with total sample means and prevalences, and second, we used external criteria as risk references, i.e. the 5/4 binge drinking criterion and a cut-off of ≥ 2 in the CRAFFT-d (Tossmann et al., 2009).

In a final step, we conducted cross-class comparisons on associated risk factors using chi-square tests for categorical variables and analyses of variance (ANOVA) for continuous variables applying the statistical software package SPSS 18 (IBM Corp., Armonk, NY). Significant overall ANOVAs ($\alpha \leq .05$) were followed by Tukey’s HSD post hoc tests. Significance levels of chi-square tests ($\alpha \leq .05$) were Bonferroni–Holmes adjusted in order to control for Type I error inflation as a result of multiple testing. In order to facilitate clinical interpretability of results, we used the “most likely class” approach for assigning subjects to classes. We ran an additional sensitivity analysis in which we included only subjects that were assigned with a probability of 50% or more to a certain class to verify interpretation of the class solution.

3. Results

The measures used showed good internal consistency (Cronbach’s α) of .87 for the brief RAPI (Earleywine et al., 2008), and for the SPS-J subscales “aggressive-dissocial behavior” (.78), “anger-control” (.75), “anxiety/depression” (.89), and “self-esteem problems” (.71) (Hampel

& Petermann, 2005). The CRAFFT-d measure showed a Cronbach's α of .53 (Tossmann et al., 2009).

3.1. Number of latent classes

Three different model solutions were recommended by different fit indices. A two-class model was suggested by the likelihood ratio tests (LR1p, LR2p) (Table 2). A 7-class model was suggested by BIC and a 9-class model by AIC. Because different statistical fit indices suggested different class solutions research objective and practical interpretability received more weight in deciding on the number of classes as recommended (Jung & Wickrama, 2008; Kriston et al., 2011; Muthén & Muthén, 2000). In the 2-class solution, 283 subjects (89.6%) were assigned to one class. Therefore, interpretation of the 2-class solution did not meet our research objective of an in-depth analysis of drinking patterns with the aim to infer practical implications for tailoring interventions according to drinking patterns and associated risks. Because of the good performance by the BIC in simulation studies and its sensitivity even to small sample sizes (Nylund, Asparouhov, & Muthén, 2007), we decided to retrieve the 7-class model instead of the 9-class model for further analyses. However, two latent classes comprised only $n = 6$ adolescents each, a sample size too small for further analyses. Therefore, those 5 classes representing $>2\%$ of the total sample were used for further analyses, resulting in a sample size of $N = 304$.

3.2. Latent class characteristics

The five classes including a sufficient number of participants for further analyses (Swanson, Lindenberg, Bauer, & Crosby, 2012; Tein et al., 2013) revealed distinct indicator response patterns as shown in Fig. 1 for continuous indicator variables. The additional sensitivity analysis in which we included only subjects that could be assigned with a probability of 50% or more to a certain class confirmed our primary findings. The characteristics of the identified classes are reported in Table 3.

Class 1 ("low-risk"; 61.2%). Adolescents in this subgroup exhibited low-risk drinking as demonstrated by endorsements below total sample means and below external risk references on all indicator variables. On average, they consumed less than 5 standard drinks on a typical drinking occasion, only 31.7% in this group reported at least one occasion of drunkenness in addition to the index episode in the past 3 months. 27.9% reported at least one binge drinking episode in the past 30 days. Class 1 was the only class with CRAFFT-d scores below the cut-off indicating risk.

Adolescents in class 2 ("moderate-risk"; 5.7%) were characterized by positive screening results for alcohol-related problems and alcohol-related risk behaviors. In contrast to class 1, a considerably higher percentage reported at least one binge drinking episode in the past 30 days (58.8% vs 27.9%) and at least one occasion of drunkenness in the past 3 months (66.7% vs 31.7%). Prevalence of prior alcohol-related hospitalization was also high in this subgroup (27.8%). Due to

the positive screening results and high prevalences of binge drinking and drunkenness, this class was labeled "moderate-risk drinkers."

Class 3 ("frequent drunk"; 15.8%). Adolescents in this class consumed on average 5.8 standard drinks, they screened positive for alcohol-related risk behaviors, and reported a brief RAPI score of 9.3. 100% of adolescents with valid data on this variable reported being drunk at least once during the past 3 months with a median of 4 occasions and 56.3% reported binge drinking at least once in the past 30 days (median = 3). This response pattern of indicator variables was most prominently characterized by the high prevalence and frequency of drunkenness and was therefore labeled "frequent drunk."

Class 4 ("alcohol-related problems"; 11.4%) who reported experiencing a very high number of alcohol-related problems ($M = 26.8$) and a very high prevalence of previous hospitalizations as a result of alcohol use (32.4%). Adolescents in this class reported consuming an average of 6.6 standard drinks and screened positive for alcohol-related risk behaviors. Due to the very high endorsement of alcohol-related problems and prevalence of previous alcohol-related ED visits, we labeled this latent class "alcohol-related problems."

Class 5 ("excessive drinking"; 5.1%). Adolescents in this class reported a mean consumption of 18.5 standard drinks on a typical drinking occasion, 100% of subjects with valid data on this variable reported being drunk at least once in the past 3 months (median frequency = 11.5). The 30-day prevalence of binge drinking at least once was 75.0% in this class with a median of 5 occasions. As expected, adolescents in this class reported a very high number and frequency of alcohol-related problems ($M = 27.5$) and a high prevalence of previous alcohol-related hospitalizations (18.8%). We labeled this class "excessive drinking."

3.3. Cross-class comparisons

In a second step, we compared the classes on (1) sociodemographic variables, (2) other substance use, and (3) psychosocial problems. Detailed information on means and significance tests is given in Table 4.

3.3.1. Sociodemographics

Comparisons between classes revealed no significant differences with regard to age ($p = .071$), gender ($p = .993$), or migration background ($p = .103$). School status differed significantly between classes ($p < .001$) with class 1 reporting the highest percentage of school attendees (95.7%) and class 5 reporting the lowest percentage (68.8%).

3.3.2. Substance use

Significant cross-class differences were observed for age at first nicotine use with class 1 revealing higher age at first use than class 4 ($p = .009$) (Table 4). Age at first use of cannabis and alcohol did not differ between classes. Prevalence of ecstasy use was too low for cross-class analyses (Table 1). Frequency of nicotine use differed significantly between classes with class 1 reporting fewer days of nicotine use than class 3 ($p = .011$) and 4 ($p < .001$). Number of days of cannabis use did not differ between classes. Finally, class 1 was associated with significantly lower drug-related risk behaviors when compared to classes 4 ($p < .001$) and 5 ($p = .001$).

3.3.3. Psychosocial problems

The Screening for Mental Disorders in Adolescence (SPS-J) revealed significant differences between classes on all subscales (Table 4). In particular, class 1 was associated with significantly lower self-esteem problems than class 4 ($p = .004$). Anxiety and depression differed significantly between classes 1 and 4 ($p < .001$) and 3 and 4 ($p = .015$), with class 4 exhibiting more anxiety and depression symptoms. Adolescents in class 1 reported less aggressive-dissocial behaviors than adolescents in classes 4 ($p < .001$), 3 ($p = .008$), and 5 ($p < .001$). Also class 4 membership was associated with more aggressive-dissocial behaviors than classes 3 ($p < .001$) and 2 ($p = .001$). Adolescents in class 5

Table 2
Fit indices for the latent class analysis models.

Model	AIC	BIC	Entropy	LR1p	LR2p	LRbop
1-class solution	7153.255	7194.568	na	na	na	na
2-class solution	6694.857	6762.460	.884	.0013	.0015	<.0001
3-class solution	6589.318	6683.211	.781	.3053	.3126	<.0001
4-class solution	6519.438	6639.621	.774	.0832	.0863	<.0001
5-class solution	6481.884	6628.358	.792	.7662	.7700	<.0001
6-class solution	6446.073	6618.837	.772	.3358	.3399	<.0001
7-class solution	6406.026	6605.080	.767	.3119	.3168	<.0001
8-class solution	6392.675	6618.019	.752	.7003	.7044	<.0001
9-class solution	6374.903	6626.537	.763	.2621	.2654	<.0001

Note: AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion, LR1p = p -value for the Vuong-Lo-Mendell-Rubin likelihood ratio test; LR2p = p -value for the Lo-Mendell-Rubin adjusted likelihood ratio test; LRbop = p -value for the parametric bootstrapped likelihood ratio test.

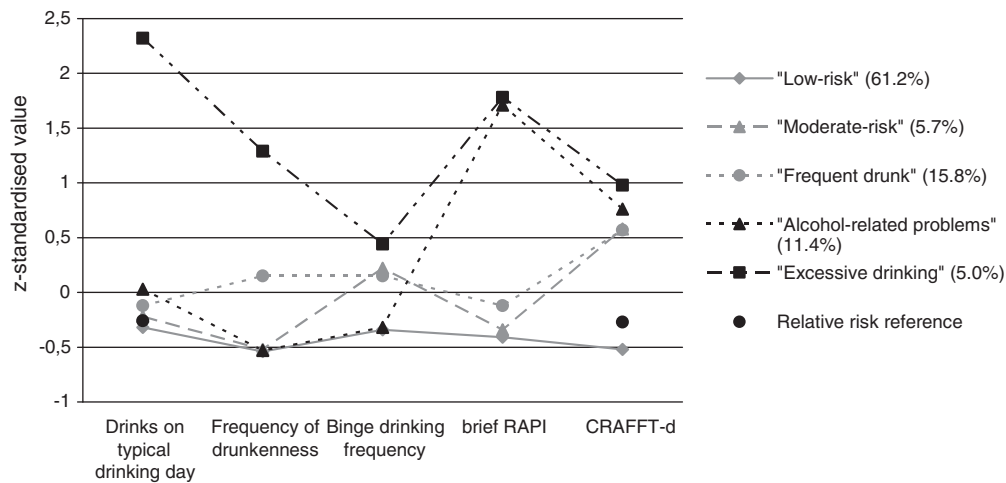


Fig. 1. Class characteristics regarding continuous indicator variables.

reported more aggressive-dissocial behavior than adolescents in class 3 ($p = .030$). Finally, anger-control problems were reported more often in class 4 than in classes 1 ($p < .001$), 3 ($p = .003$), and 2 ($p = .020$), and more often in class 5 than in class 1 ($p = .002$). Other pairwise comparisons did not differ significantly.

4. Discussion

4.1. Drinking patterns

Five sufficiently large classes of adolescents with meaningfully distinct habitual drinking patterns were identified. 61.2% of the sample reported low risk habitual drinking (class 1) as characterized by below sample average alcohol consumption, alcohol-related problems, and alcohol-related risk behaviors. Additionally, comparison of indicator variable endorsement with age-matched general population samples or screening test cut-offs revealed “below average” or “low risk” on all indicator variables. As expected, this group did not report problematic

use of other substances nor psychosocial problems. Class 2 “moderate-risk” was characterized by a relatively high proportion of adolescents reporting at least one occasion of drunkenness and binge drinking in addition to the index episode accompanied by a positive CRAFFT-d screening. While adolescents in this group exhibited risky alcohol use and experienced some alcohol-related problems, this group did not show high scores on other risk factors associated with the development of alcohol-related disorders such as other substance use or psychosocial problems. Class 3 “frequent drunk” was most prominently characterized by a very high prevalence and frequency of drunkenness. Similar to class 2, adolescents in this class screened positive for alcohol-related risk behaviors while not exhibiting frequent other substance use or psychosocial problems. Therefore, members of classes 2 and 3 (16.5% of the total sample) were classified as habitual risky drinkers. However, little other substance use and the absence of psychosocial problems may indicate good chances for maturing out of risky drinking in these two classes. Classes 4 and 5 (16.5% of the sample) were classified as high-risk drinkers. Class 4 (11.4%) comprised adolescents

Table 3
Characteristics of the identified classes.

Indicator variable	Class 1 n = 186 (61.2%)	Class 2 n = 18 (5.7%)	Class 3 n = 48 (15.8%)	Class 4 n = 36 (11.4%)	Class 5 n = 16 (5.1%)	Total N = 304	Risk reference
<i>Typical nr of standard drinks</i>							
Mean (SD)	4.71 (3.41)	5.22 (2.95)	5.75 (2.90)	6.55 (2.83)	18.46 (4.13)	5.98 (4.63)	M = 5.0 ^a
<i>Being drunk in the last 3 months</i>							
Valid data (n)	120	12	38	20	6	196	
Proportion at least once; n (percent) ^b	38 (31.7)	8 (66.7)	38 (100)	9 (45.0)	6 (100)	99 (50.5)	21.0% ^c
Nr if at least once; median (IQR)	1.00 (0)	1.00 (0.75)	4.00 (3)	1.00 (0.5)	11.5 (7.75)	2 (3)	–
<i>Binge-drinking occasions in last 30 days</i>							
Valid data (n)	172	17	48	34	16	287	
Proportion at least once; n (percent) ^b	48 (27.9)	10 (58.8)	27 (56.3)	20 (58.8)	12 (75.0)	117 (40.8)	17.4% ^d
Nr if at least once; median (IQR)	1.00 (1)	1.00 (2.25)	3.00 (4)	1.5 (2)	5.00 (3.75)	2 (2)	–
<i>Previous hospitalization</i>							
Valid data (n) 177 18	48	34	16	304			
Proportion “yes”; n (percent) ^b	6 (3.4)	5 (27.8)	2 (4.2)	11 (32.4)	3 (18.8)	27 (9.2)	2.0% ^e
<i>Alcohol-related problems (brief RAPI)</i>							
Mean (SD)	6.50 (5.71)	7.14 (3.82)	9.27 (5.58)	26.78 (7.74)	27.45 (10.25)	10.28 (9.57)	–
<i>Alcohol-related risk behaviors (CRAFFT-d)</i>							
Mean (SD)	1.42 (0.96)	3.00 (1.50)	2.98 (1.26)	3.25 (1.34)	3.56 (0.89)	2.11 (1.38)	M = 2.0 ^f

^a 5/4 Binge drinking criterion (Wechsler et al., 1994).

^b Proportion in relation to valid data.

^c 30-day prevalence of being drunk for 15–16-year-old students in Germany (Hibell et al., 2012).

^d 30-day binge drinking prevalence for 12–17-year olds in Germany (Bundeszentrale für gesundheitliche Aufklärung (BZgA), 2014)

^e 12-month prevalence of alcohol-related hospitalization for 15–16-year-old students in Germany (Hibell et al., 2012).

^f Cut-off for positive screening (Tossmann et al., 2009). SD = Standard deviation; IQR = Interquartile range.

Table 4
Cross-class comparisons on demographics, substance use, and psychosocial problems.

Variable	Class 1	Class 2	Class 3	Class 4	Class 5	Test statistic	p-value	Significant pairwise post hoc tests ^a
<i>Demographics</i>								
Gender (% female)	49.7	47.1	50.0	45.7	50.0	Chi ² = 0.24	.993	n/a
Age	15.66 (1.19)	16.24 (0.83)	15.96 (1.08)	15.51 (1.23)	16.05 (1.14)	F = 1.96	.071	n/a
Migration background (% yes)	19.4	6.25	27.3	18.8	7.7	Chi ² = 7.70	.103	n/a
School status (% attending school)	95.7	81.3	85.3	81.3	68.8	Chi ² = 20.72	<.001***	n/a
<i>Substance use</i>								
Age at first use								
Alcohol	13.42 (2.05)	12.89 (2.03)	12.98 (2.09)	12.66 (2.29)	12.66 (2.0)	F = 1.86	.173	n/a
Nicotine	13.39 (1.99)	13.13 (2.20)	13.20 (1.76)	11.94 (2.34)	12.0 (3.12)	F = 3.42	.003**	Class 1 > Class 4
Cannabis	14.14 (2.12)	14.13 (1.89)	14.23 (1.63)	13.73 (1.42)	14.45 (1.37)	F = 0.82	.833	n/a
Days of use (past 30 days)								
Nicotine	10.5 (12.47)	12.86 (14.51)	18.24 (12.44)	22.29 (11.89)	18.76 (13.42)	F = 5.85	<.001***	Class 1 < Class 3 Class 1 < Class 4
Cannabis	2.26 (6.3)	4.86 (11.11)	3.46 (5.94)	2.93 (3.1)	5.94 (10.3)	F = 0.54	.743	n/a
Drug-related risk behaviors (RAFFT)	0.78 (0.93)	1.25 (0.78)	1.17 (1.04)	1.68 (1.20)	1.88 (1.59)	F = 9.15	<.001***	Class 1 < Class 4 Class 1 < Class 5
<i>Psychosocial problems (SPS-J)</i>								
Internalizing tendencies								
Self-esteem problems	3.42 (2.34)	3.82 (2.63)	3.74 (2.14)	5.0 (2.46)	4.53 (2.67)	F = 2.99	.006**	Class 1 < Class 4
Anxiety/depression	5.98 (4.56)	6.47 (4.69)	6.62 (4.14)	9.94 (4.82)	8.0 (5.20)	F = 4.14	.001***	Class 1 < Class 4 Class 3 < Class 4
Externalizing tendencies								
Aggressive-dissocial behaviors	3.67 (2.56)	4.92 (2.51)	5.16 (2.58)	8.29 (2.98)	7.46 (4.06)	F = 17.05	<.001***	Class 1 < Class 3 Class 1 < Class 4 Class 1 < Class 5 Class 2 < Class 4 Class 3 < Class 4 Class 3 < Class 5
Anger-control problems	3.63 (2.52)	3.88 (2.32)	4.09 (2.80)	6.34 (3.08)	6.38 (3.5)	F = 7.59	<.001***	Class 1 < Class 4 Class 1 < Class 5 Class 2 < Class 4 Class 3 < Class 4 Class 3 < Class 5

Note. With the exception of gender (% female), migration background (% yes), and school status (% attending school), data report means (standard deviations).

^a Non-significant pairwise post hoc tests are not reported.

** Type I error < .01.

*** Type I error < .001.

reporting severe alcohol-related problems as indicated by a mean brief RAPI-score 4 times above that of class 1 and by the highest proportion of adolescents with previous alcohol-related hospitalizations (32.5%). Membership in this class was associated with most severe psychosocial problems, in particular with positive screenings for aggressive-dissocial behavior and anxiety/depression, indicating clinically relevant differences from other classes. Furthermore, members of this class reported most days of nicotine use and scored high on drug-related risk behaviors. The identification of this subgroup showed that assessing drinking quantity and frequency as sole indicators of problematic alcohol consumption may result in overlooking adolescents who experience severe consequences of their alcohol use and, as found in this sample, co-occurring psychosocial problems and drug-related risk behaviors, a constellation which may lower chances of maturing out of problematic alcohol use if untreated. Class 5 (5.1%) was most strongly characterized by excessive drinking with a mean consumption of 18.46 standard drinks on a typical drinking occasion. As expected, this group also showed high prevalences and frequencies of binge drinking and drunkenness, screened positive for alcohol-related risk behaviors (CRAFFT-d), and exhibited a very high average brief RAPI score indicating severe alcohol-related problems. This group also screened positive for psychosocial problems, in particular aggressive-dissocial behavioral problems, a finding relevant to address when delivering targeted interventions to this subgroup. Two additional classes were identified in the LCA. In our study, however, these classes were underrepresented (3.8% of the total sample) and could therefore not be included in further analyses. Preliminary descriptive analyses indicated that these classes may represent further subgroups of high-risk drinking with a mean of 22.2

standard drinks consumed on a typical drinking day (SD 2.98) in class 6 and a median 3-month frequency of drunkenness of 19 occasions (IQR 13) in class 7. The relatively low prevalence of regular alcohol use in this sample (20.9%) supports our approach of conceptualizing risky adolescent drinking by a set of variables depicting frequency of heavy use, quantity of use, alcohol-related problems, and alcohol-related risk behaviors.

To our knowledge, we are the first to investigate drinking patterns in a sample of adolescents treated for AAI with a LCA. Descriptive information on samples of adolescent AAI patients in ED provide little reference on subgroups of risky drinkers, since they traditionally report means of one-dimensional measures for the entire sample and hereby obscure patterns of variable endorsement relevant for identifying high risk subgroups. For example, [Stolle, Sack, Bröning, Baldus, and Thomasius \(2013\)](#) reported a percentage of 68.2% of 12–21 year olds treated for AAI in an ED to screen positive for risky alcohol use in the RAFFT alcohol screening test, whereas [Müller et al. \(2009\)](#) reported 24.2% of 11–17 year olds treated for AAI in an ED to consume 5 or more standard drinks on a typical drinking day and [Reis, Pape, and Hassler \(2009\)](#) found 23.4% regular alcohol users (at least weekly) in a similar sample of 10–17 year olds. These studies all report percentages between 11.3% and 15.9% of youth with repeated hospitalizations due to AAI, a characteristic certainly indicating repeated high-risk drinking, but the data from these studies also show the difficulty of determining “risky drinking” by a single indicator.

Previous studies using LCA to examine youthful drinking have revealed 3 or 4 classes of adolescents with distinct drinking patterns ([Reboussin et al., 2006](#); [Chiauzzi et al., 2013](#); [Beseler et al., 2012](#)) or

patterns of behaviors associated with risky drinking (Ray et al., 2012) typically representing high-risk, moderate-risk, and low-risk drinking with one or two classes in each of these three risk categories. The 5 classes identified in this study may also be interpreted as representing 3 risk categories: 1) low risk (class 1, 61.2%), 2) moderate risk (classes 2 and 3, 21.5%), and 3) high risk (classes 4 and 5, 16.5%), however, with qualitatively distinct drinking patterns and characteristics with implications for individualized interventions. The high and moderate risk categories in our sample of AAI patients were somewhat smaller than those identified in a sample of college students with 20.2% high-risk drinkers and 13.6% moderate-risk drinkers (Chiausuzzi et al., 2013) or a community sample with 27% “regular problem drinkers” and 30% “risky problem drinkers.” However, adolescents in these studies were considerably older (16–20 years in the community sample, mean age of 18.3 years (SD = 0.9) in the college student sample) than in our AAI sample with a mean age of 15.8 years (SD 1.16) possibly explaining the different percentages of the samples represented in each category.

In contrast to other studies, our findings did not replicate findings on cannabis use being strongly associated with risky drinking (Reboussin et al., 2006; Wagner & Anthony, 2002). This finding is likely due to the young age of our study sample and the associated low prevalence of cannabis use. Also contrary to previous research (Grant et al., 2001), we did not find associations between drinking patterns and age or age of onset of alcohol use. The age accumulation in our sample around age 15 with relatively small variance may have resulted in the need for a larger sample size in order to detect statistically significant age differences. Finally, often observed gender differences (Bouthoorn, van Hoof, & van der Lely, 2011; Chiauzzi et al., 2013) were not replicated in this study. However, our finding might be due to male and female adolescent drinking habits assimilating as recently observed in the UK (Healey et al., 2014).

4.2. Limitations

First, since this study took place in urban EDs, it is possible that different drinking patterns would have been found in rural ED patients. Second, all measures used in this study rely on self-report. This has, however, been found to be a valid method for drinking assessment in this population (Vitale, van de Mheen, van de Weil, & Garretsen, 2006). Third, self-report data on the number of standard drinks consumed may be imprecise due to the commonly reported drinking habit of sharing one bottle of a self-made mix of spirits among a group of adolescents. This drinking habit often implies that consumers are not aware of the quantity of spirits contained in a bottle and that they have problems indicating the number of drinks consumed. However, in order to increase quality of data, alcohol consumption data were assessed through an interview by trained research assistants. Finally, the brief RAPI was translated into German as part of this study, resulting in the use of this instrument without prior validation of the German version. However, previous translations of the RAPI into other languages revealed good reliability and validity (López-Núñez et al., 2012) and reliability in our study was good ($\alpha = .87$) so that interpretation of brief RAPI scores with some caution seem acceptable.

4.3. Implications for prevention and intervention

Identification of these 5 drinking patterns provides valuable information for practitioners. First, knowledge about characteristics of these classes may facilitate individualization of interventions. In particular, interventions could be tailored to focus on characteristic drinking habits taking into account associated other substance use and psychosocial problems. Second, we identified two screening instruments that distinguish well between relevant classes. The CRAFFT-d separated well between class 1 (negative screening) and all other classes (positive screening) and may therefore be a useful tool to identify classes and plan interventions accordingly. Furthermore, the brief RAPI performed

well in identifying the risky drinking classes 2 and 3 (positive screening, mean scores 7–9) and high-risk drinking classes 4 and 5 (mean scores 26–27).

4.4. Future research directions

Because this is the first analysis of drinking patterns in an adolescent ED sample of AAI patients with a LCA, study replications would be desirable in order to validate findings. Furthermore, longitudinal studies would be desirable to examine the course of development of drinking patterns, taking into account individual transitions from one drinking pattern to another and conditions under which these transitions occur. Future research should also investigate whether class membership is associated with differential intervention effectiveness, since prior research found baseline alcohol use moderating intervention effectiveness (Carey, Scott-Sheldon, Carey, & DeMartini, 2007; Spirito et al., 2004). Finally, future work is needed to evaluate whether tailoring of BIs according to latent class profiles enhances effectiveness.

5. Conclusion

For the first time, drinking patterns of adolescent AAI patients in ED were examined using LCA. Findings provide insights into characteristics and size of subgroups with varying degrees of risky drinking and associated risk factors. Practical implications for latent class identification and intervention individualization can be derived from our study findings.

Role of funding source

This study was prepared as part of the research project *Health network alcohol abuse in adolescence: Improved access-to-care for children and adolescents with at-risk alcohol use* (PI: R. Thomasius) which constitutes a sub-project of *psychnet—the Hamburg Network for Mental Health* (Härter et al., 2012). The project *psychnet* is funded by the German Federal Ministry of Education and Research (BMBF) [grant number 01KQ1002B]. The BMBF had no role in study design, data collection, analysis or interpretation, nor in writing the manuscript or the decision to submit the paper for publication.

Contributors

SD was responsible for study conceptualization and design. LK, SD, and LW conducted the statistical analyses. All authors contributed to the interpretation of the findings. SD wrote the initial draft of the manuscript. LK, MH, NA, LW, PMS, and RT (PI) provided feedback and edits on all paper sections. All authors contributed to and approved the final manuscript.

Conflict of interest

All authors declare that they have no conflict of interest to disclose.

Acknowledgements

This study was conducted as part of the research project *psychnet – the Hamburg Network for Mental Health* (Härter et al., 2012). *Psychnet* (2011–2015) aims at strengthening health care regions in Germany by establishing new transsectoral cooperations and implement and evaluate selected innovations. Further information and a list of all project partners can be found at <http://www.psychnet.de>. We wish to thank research assistants Victoria Winter, Kristina Wille, Sabrina Kunze-Klempert, Janina Windsor, Lina Denning, Lisa Zahn, Katharina Kroeger for conducting data collection and assisting in data management.

References

- Afifi, A.A., Kotlerman, J.B., Ettner, S.L., & Cowan, M. (2007). Methods for improving regression analysis for skewed continuous or counted responses. *Annual Review of Public Health, 28*, 95–111.
- Atkins, D.C., & Gallop, R.J. (2007). Rethinking how family researchers model infrequent outcomes: A tutorial on count regression and zero-inflated models. *Journal of Family Psychology, 21*(4), 726–735.
- Beseler, C.L., Taylor, L.A., Kraemer, D.T., & Leeman, R.F. (2012). A latent class analysis of DSM-IV alcohol use disorder criteria and binge drinking in undergraduates. *Alcoholism: Clinical and Experimental Research, 36*(1), 153–161. <http://dx.doi.org/10.1111/j.1530-0277.2011.01595.x>.
- Bitunjac, K., & Saraga, M. (2009). Alcohol intoxication in pediatric age: Ten-year retrospective study. *Croatian Medical Journal, 50*, 151–156.
- Bohnert, K.M., Walton, M.A., Resko, S., Barry, K.T., Chermack, S.T., Zucker, R.A., et al. (2014). Latent class analysis of substance use among adolescents presenting to urban primary care clinics. *The American Journal of Drug and Alcohol Abuse, 40*(1), 44–50.

- Bouthoorn, S.H., van Hoof, J.J., & van der Lely, N. (2011). Adolescent alcohol intoxication in Dutch hospital centers of pediatrics: Characteristics and gender differences. *European Journal of Pediatrics*, 170(8), 1023–1030.
- Bundeszentrale für gesundheitliche Aufklärung (BZgA) (2012). *Die Drogenaffinität Jugendlicher und junger Erwachsener in Deutschland 2012 [Drugaffinity of adolescents and young adults in Germany 2012]*. Ergebnisse einer aktuellen Repräsentativbefragung und Trendsfindings and trends from the current representative survey. Köln: Bundeszentrale für gesundheitliche Aufklärung.
- Bundeszentrale für gesundheitliche Aufklärung (BZgA) (2014). *Der Alkoholkonsum Jugendlicher und junger Erwachsener in Deutschland 2012 [Alcohol consumption of adolescents and young adults in Germany 2012]*. Ergebnisse einer aktuellen Repräsentativbefragung und Trendsfindings and trends from the current representative survey. Köln: Bundeszentrale für gesundheitliche Aufklärung.
- Camatta, C.D., & Nagoshi, C.T. (1995). Stress, depression, irrational beliefs, and alcohol use and problems in a college student sample. *Alcoholism: Clinical and Experimental Research*, 19, 142–146.
- Carey, K.B., Scott-Sheldon, L.A.J., Carey, M.P., & DeMartini, K.S. (2007). Individual-level interventions to reduce college student drinking: a meta-analytic review. *Addictive Behaviors*, 32, 2469–2494.
- Champion, H.L., Foley, K.L., DuRant, R.H., Hensberry, R., Altman, D., & Wolfson, M. (2004). Adolescent sexual victimization, use of alcohol and other substances, and other health risk behaviors. *The Journal of Adolescent Health*, 35, 321–328.
- Chiauzzi, E., DasMahapatra, P., & Black, R.A. (2013). Risk behaviors and drug use: A latent class analysis of heavy episodic drinking in first-year college students. *Psychology of Addictive Behaviors*, 27(4), 974–985.
- Clark, D.B., Cornelius, J.R., Kirisci, L., & Tarter, R.E. (2005). Childhood risk categories for adolescent substance involvement: a general liability typology. *Drug and Alcohol Dependence*, 77, 13–21.
- Deas, D., Riggs, P., Langenbucher, J., Goldman, M., & Brown, S. (2000). Adolescents are not adults: Developmental considerations in alcohol users. *Alcoholism: Clinical and Experimental Research*, 24, 232–237.
- Diestelkamp, S., Arnaud, N., Sack, P.M., Wartberg, L., Daubmann, A., & Thomasius, R. (2014). Brief motivational intervention for adolescents treated for acute alcohol intoxication in the emergency department—a randomized-controlled trial. *BMC Emergency Medicine*, 13, 14.
- Earleywine, M., LaBrie, J.W., & Pedersen, E.R. (2008). A brief Rutgers Alcohol Problem Index with less potential for bias. *Addictive Behaviors*, 33, 1249–1253.
- Ellickson, P.L., McGuigan, K.A., Adams, V., Bell, R.M., & Hays, R.D. (1996). Teenagers and alcohol misuse in the United States: By any definition, it's a big problem. *Addiction*, 91, 1489–1503.
- Fandler, E., Scheer, P., Rödl, S., & Müller, W. (2008). Alkoholmissbrauch und -abhängigkeit bei Kindern und Jugendlichen [Alcohol misuse and dependence in children and adolescents]. *Monatsschrift für Kinderheilkunde*, 156, 591–604.
- Gardner, W., Mulvey, E.P., & Shaw, E.C. (1995). Regression analyses of counts and rates: Poisson, overdispersed Poisson, and negative binomial models. *Psychological Bulletin*, 118(3), 392–404.
- Gesundheitsberichterstattung des Bundes: Diagnosedaten der Krankenhäuser ab (2000). Gesundheitsberichterstattung des Bundes: Diagnosedaten der Krankenhäuser ab [Federal Health Statistics: Data on Diagnoses in Hospitals from 2000]. (Retrieved February 2nd, 2014, from) http://www.gbe-bund.de/oowa921-install/servlet/oowa/aw92/WWS0100/_XWD_FORMPROC?TARGET=&PAGE=_XWD_106&OPINDEX=4&HANDLER=_XWD_CUBE.SETPGS&DATACUBE=_XWD_134&D.001=1000001&D.002=25&D.003=1000004&D.972=1000619&D.100=10101
- Grant, B.F., Stinson, F.S., & Harford, T.C. (2001). Age at onset of alcohol use and DSM-IV alcohol abuse and dependence. A 12-year follow-up. *Journal of Substance Abuse*, 13, 493–504.
- Hampel, P., & Petermann, F. (2005). *Screening for Mental Disorders in Adolescence [Screening psychischer Störungen im Jugendalter (SPS-J)]*. Bern: Huber.
- Härter, M., Kentgens, M., Brandes, A., Bock, T., Dirmaier, J., Erzberger, M., et al. (2012). Rationale and content of psychenet: The Hamburg network for mental health. *European Archives of Psychiatry and Clinical Neuroscience*, 262(2), 57–63.
- Healey, C., Rahmana, A., Faizal, M., & Kinderman, P. (2014). Underage drinking in the UK: Changing trends, impact and interventions. A rapid evidence synthesis. *The International Journal of Drug Policy*, 25, 124–132.
- Hibell, B., Guttormsson, U., Ahlström, S., Balakireva, O., Bjarnason, T., Kokkevi, A., et al. (2012). The 2011 ESPAD Report. Substance use among students in 36 European countries. (Retrieved November 3rd, 2012, from) http://www.espad.org/Uploads/ESPAD_reports/2011/The_2011_ESPAD_Report_FULL_2012_10_29.pdf
- Iacono, W.G., Malone, S.M., & McGue, M. (2008). Behavioral disinhibition and the development of early-onset addiction: Common and specific influences. *Annual Review of Clinical Psychology*, 4, 325–348.
- Jung, T., & Wickrama, K.A.S. (2008). An introduction to latent class growth analysis and growth mixture modeling. *Social and Personality Psychology Compass*, 2, 302–317.
- Kraus, L., Hannemann, T.V., Pabst, A., Kronthaler, F., Grübl, A., Stürmer, M., et al. (2012). Stationäre Behandlung von Jugendlichen mit akuter Alkoholintoxikation: Die Spitze des Eisbergs? *Gesundheitswesen*, 75, 456–464.
- Kriston, L., Melchior, H., Hergert, A., Bergelt, C., Watzke, B., Schulz, H., et al. (2011). Class Evolution Tree: a graphical tool to support decisions on the number of classes in exploratory categorical latent variable modeling for rehabilitation research. *International Journal of Rehabilitation Research*, 34, 181–185. <http://dx.doi.org/10.1097/MRR.0b013e3283460e7d>
- Kuzelová, M., Harárová, A., Ondriasová, E., Wawruch, M., Riedel, R., Benedeková, M., et al. (2009). Alcohol intoxication requiring hospital admission in children and adolescents: Retrospective analysis at the University Children's Hospital in the Slovak Republic. *Clinical Toxicology (Philadelphia, Pa.)*, 47(6), 556–561.
- Laging, M. (2005). Assessment und Diagnostik in der sekundären Suchtprävention bei Jugendlichen. *Prevention*, 1, 9–12.
- Lanza, S.T., & Rhoades, B.L. (2013). Latent class analysis: an alternative perspective on subgroup analysis in prevention and treatment. *Prevention Science*, 14, 157–168.
- López-Núñez, C., Fernández-Artamendi, S., Fernández-Hermida, S.R., Álvarez, Á. C., & Secades-Villa, R. (2012). Spanish adaptation and validation of the Rutgers Alcohol Problem Index (RAPI). *International Journal of Clinical and Health Psychology*, 12(2), 251–264.
- Loukova, A. (2011). Study of acute alcohol poisoning in children admitted to an emergency hospital Pirogov in Sofia, Bulgaria. *Macedonian Journal of Medical Sciences*, 4(3), 275–280.
- McCutcheon, A.L. (1987). *Latent Class Analysis*. Sage University Paper Series on Quantitative Applications in the Social Sciences. (No. 07-064). Newberry Park, CA: Sage.
- Merline, A., Jager, J., & Schulenberg, J.E. (2008). Adolescent risk factors for adult alcohol use and abuse: Stability and change of predictive value across early and middle adulthood. *Addiction*, 103, 84–99.
- Müller, S., Pabst, A., Kronthaler, F., Grübel, A., Kraus, L., Burdach, S., et al. (2009). Akute Alkoholvergiftung bei Jugendlichen – Erste Ergebnisse eines Münchener Pilotprojekts. *Deutsche Medizinische Wochenschrift*, 21, 1101–1105.
- Muthén, B.O., & Muthén, L.K. (2000). Integrating person-centered and variable-centered analyses: Growth mixture modeling with latent trajectory classes. *Alcoholism: Clinical and Experimental Research*, 24, 882–891.
- Muthén, L.K., & Muthén, B.O. (2011). *Mplus User's Guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.
- Nylund, K.L., Asparouhov, T., & Muthén, B. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling*, 14(4), 535–569.
- Pardini, D.A., White, H.R., & Stouthamer-Loeber, M. (2007). Early adolescent psychopathology as a predictor of alcohol use disorders by young adulthood. *Drug and Alcohol Dependence*, 88, 38–49.
- Ray, A.E., Stapleton, J.L., Turrissi, R., & Phillion, E. (2012). Patterns of drinking-related protective and risk behaviors in college student drinkers. *Addictive Behaviors*, 37, 449–455.
- Reboussin, B.A., Song, E.Y., Shrestha, A., Lohman, K.K., & Wolfson, M. (2006). A latent class analysis of underage problem drinking: Evidence from a community sample of 16–20 year olds. *Drug and Alcohol Dependence*, 83, 199–209.
- Reis, O., Pape, M., & Hassler, F. (2009). Ergebnisse eines Projektes zur kombinierten Prävention jugendlichen Rauschtrinkens [Evaluation of a project for the prevention of adolescent binge-drinking]. *Sucht*, 55(6), 347–356.
- Schuckit, M.A., Smith, T.L., & Kalmijn, J.A. (2014). The patterns of drug and alcohol use and associated problems over 30 years in 397 men. *Alcoholism: Clinical and Experimental Research*, 38(1), 227–234.
- Shepherd, J.P., Sutherland, I., & Newcombe, R.G. (2006). Relations between alcohol, violence and victimization in adolescence. *Journal of Adolescence*, 29(4), 539–553. <http://dx.doi.org/10.1016/j.adolescence.2006.06.005>
- Sindelar, H.A., Barnett, N.P., & Spirito, A. (2004). Adolescent alcohol use and injury: A summary and critical review of the literature. *Minerva Pediatrica*, 56(3), 291–309.
- Spirito, A., Monti, P.M., Barnett, N.P., Colby, S.M., Sindelar, H., Rohsenow, D.J., et al. (2004). A randomized clinical trial of a brief motivational intervention for alcohol-positive adolescents treated in an emergency department. *The Journal of Pediatrics*, 145(3), 396–402.
- Stewart, C., & Power, T.G. (2002). Identifying patterns of adolescent drinking: A tri-ethnic study. *Journal of Studies on Alcohol*, 63, 156–168.
- Stolle, M., Sack, P.-M., Brönning, S., Baldus, C., & Thomasius, R. (2013). Brief intervention in alcohol intoxicated adolescent—A follow-up study in an Accesso-Care sample. *Journal Alcoholism Drug Depend*, 1(106). <http://dx.doi.org/10.4172/2329-6488.1000106>
- Swahn, M.H., Simon, T.R., Hammig, B.J., & Guerrero, J.L. (2004). Alcohol consumption behaviors and risk for physical fighting and injuries among adolescent drinkers. *Addictive Behaviors*, 29, 959–963.
- Swanson, S.A., Lindenberg, K., Bauer, S., & Crosby, R.D. (2012). A Monte Carlo investigation of factors influencing latent class analysis: An application to eating disorder research. *The International Journal of Eating Disorders*, 45, 677–684.
- Tein, J.T., Cox, S., & Cham, H. (2013). Statistical power to detect the correct number of classes in latent profile analysis. *Structural Equation Modeling*, 20(4), 640–657. <http://dx.doi.org/10.1080/10705511.2013.824781>
- Tossmann, P., Kasten, L., Lang, P., & Stüber, E. (2009). Determination of the concurrent validity of the CRAFFT-d – a screening instrument for problematic alcohol consumption [Bestimmung der konkurrenten Validität des CRAFFT-d. Ein Screeninginstrument für problematischen Alkoholkonsum bei Jugendlichen]. *Zeitschrift für Kinder- und Jugendpsychiatrie und Psychotherapie*, 37, 451–459.
- Townshend, J.M., & Duka, T. (2002). Patterns of alcohol drinking in a population of young social drinkers: A comparison of questionnaire and diary measures. *Alcohol and Alcoholism*, 37, 187–192.
- Van Hoof, J.J., Van Der Lely, N., Bouthoorn, S.H., Van Dalen, W.E., & Pereira, R.R. (2011). Adolescent alcohol intoxication in the Dutch Hospital Departments of Pediatrics: A 2-year comparison study. *The Journal of Adolescent Health*, 48, 212–214.
- Viner, R.M., & Taylor, B. (2007). Adult outcomes of binge drinking in adolescence: Findings from a UK national birth cohort. *Journal of Epidemiology & Community Health*, 61, 902–907.
- Vital, S.G., van de Mheen, H., van de Weil, A., & Garretsen, H.F.L. (2006). Substance use among emergency room patients: Is self-report preferable to biochemical markers? *Addictive Behaviors*, 31, 1661–1669.

- Wagner, F.A., & Anthony, J.C. (2002). Into the world of illegal drug use: Exposure opportunity and other mechanisms linking the use of alcohol, tobacco, marijuana, and cocaine. *American Journal of Epidemiology*, *155*, 918–925.
- Wechsler, H., Davenport, A., Dowdall, G.W., Moeykens, B., & Castillo, S. (1994). Health and behavioural consequences of binge drinking in college—A national survey of students at 140 campuses. *Journal of the American Medical Association (JAMA)*, *272*, 1671–1677.
- Wechsler, H., Kuo, M., Lee, H., & Dowdall, G.W. (2000). Environmental correlates of underage alcohol use and related problems of college students. *American Journal of Preventive Medicine*, *19*, 24–29.
- Wurdak, M., Ihle, K., Stürmer, M., Dirnberger, I., Fischer, U.C., Funk, T., et al. (2013). Indikatoren für das Ausmaß jugendlichen Rauschtrinkens in Bayern [Indicators for adolescent binge drinking in Bavaria]. *Sucht*, *59*(4), 225–233.

Publication VI. Einfluss von Berater/-innen- und Interventionsvariablen auf die Veränderungsmotivation von Kindern und Jugendlichen nach einer motivierenden Kurzintervention zur Reduktion riskanten Alkoholkonsums

Reference. Diestelkamp, S., Wartberg, L., Arnaud, N. & Thomasius, R. (2016). Einfluss von Berater/-innen- und Interventionsvariablen auf die Veränderungsmotivation von Kindern und Jugendlichen nach einer motivierenden Kurzintervention zur Reduktion riskanten Alkoholkonsums. [Influence of counsellor- and intervention variables on motivation to change in children and adolescents following a brief motivational intervention to reduce risky alcohol use]. *Praxis der Kinderpsychologie und Kinderpsychiatrie*, 65, 534-549.

Format. published article

Einfluss von Berater/innen- und Interventionsvariablen auf die Veränderungsmotivation nach einer motivierenden Kurzintervention zur Reduktion riskanten Alkoholkonsums

Silke Diestelkamp, Lutz Wartberg, Nicolas Arnaud und Rainer Thomasius¹

Summary

Influence of Counsellor- and Intervention Variables on Motivation to Change Following a Brief Motivational Intervention to Reduce Risky Alcohol Use

Brief interventions are recommended for prevention and early intervention of risky alcohol use. However, evidence of their effectiveness, in particular for children and adolescents, is heterogeneous. Analysis of counsellor and intervention variables may provide insights into mechanisms of action in brief interventions and thereby contribute to an enhanced effectiveness. We analyzed data of N = 141 children and adolescents who were treated for acute alcohol intoxication in the emergency department. Study participants received a brief motivational intervention to reduce risky alcohol use during hospitalization. We applied multiple regression analysis to examine counsellor variables (empathy, affirmation, competence, congruence) and intervention variables (readiness and confidence ruler, decisional balance, goal agreement) as predictors of motivation to change. Higher scores on the basic therapeutic skill "positive affirmation" ($R^2 = 7.1\%$; $p < .01$), finishing the intervention with a written goal agreement ($R^2 = 2.9\%$; $p < .05$) and younger age were associated with greater readiness to change ($R^2 = 10.2\%$; $p < .01$). Therefore, a special focus should be put on the counsellor skill "positive affirmation" when training new counsellors. Results also indicate that younger patients respond stronger to a brief intervention in this context.

Prax. Kinderpsychol. Kinderpsychiat. 65/2016, 534-549

Keywords

brief motivational intervention – children and adolescents – alcohol – mechanisms of action

Zusammenfassung

Kurzinterventionen werden häufig als Maßnahme zur Prävention und Frühintervention bei riskantem Alkoholkonsum empfohlen. Die Evidenz für ihre Wirksamkeit, insbesondere für Kinder und Jugendliche, ist jedoch heterogen. Die Untersuchung von Berater/innen- und Interventionsvariablen kann wichtige Erkenntnisse zu Wirkmechanismen von Kurzinterventionen liefern und damit zu einer Verbesserung der Wirksamkeit beitragen.

¹ Die Autor/innen erklären, dass keine Interessenkonflikte vorliegen.

Es wurden Daten von $N = 141$ Kindern und Jugendlichen ausgewertet, die aufgrund einer akuten Alkoholintoxikation notfallmedizinisch behandelt wurden. Studienteilnehmer/innen erhielten während des Klinikaufenthalts eine motivierende Kurzintervention zur Reduktion riskanten Alkoholkonsums. Mittels multipler Regressionsanalyse wurden Berater/innenvariablen (Empathie, Wertschätzung, Kompetenz, Kongruenz) und Interventionsvariablen (Einsatz der Wichtigkeits- und Zuversichtsskala, Motivationswaage, schriftliche Zielvereinbarung) als Prädiktoren für die Veränderungsmotivation zur Reduktion des Alkoholkonsums untersucht. Höhere Ausprägungen der therapeutischen Basiskompetenz „Positive Wertschätzung“ ($R^2 = 7.1\%$; $p < .01$), das Beenden der Intervention mit einer schriftlichen Zielvereinbarung ($R^2 = 2.9\%$; $p < .05$) und geringeres Alter gingen mit einer erhöhten Veränderungsbereitschaft einher ($R^2 = 10.2\%$; $p < .01$). Insbesondere die wahrgenommene Wertschätzung durch den/die Berater/in trägt bei Kindern und Jugendlichen nach akuter Alkoholintoxikation zu einer höheren Veränderungsmotivation für einen reduzierten Alkoholkonsum bei und sollte daher in der Berater/innenausbildung besondere Berücksichtigung finden. Die Befunde sprechen außerdem dafür, dass jüngere Patient/innen von einer Kurzintervention besonders profitieren.

Schlagwörter

motivierende Kurzintervention – Kinder und Jugendliche – Alkohol – Wirkfaktoren

1 Hintergrund

1.1 Alkoholkonsum im Kindes- und Jugendalter

Bis zu ihrem 17. Lebensjahr haben 92 % der Kinder und Jugendlichen in Deutschland Alkohol konsumiert (Hibell et al., 2012). Besonders schwerwiegende gesundheitliche und psychosoziale Folgen hat hierbei der episodisch exzessive Konsum von Alkohol. 58.7 % der 15- bis 16-jährigen Schüler/innen berichten, in den vergangenen 30 Tagen mindestens einmal fünf oder mehr (vier oder mehr für Mädchen) Getränke bei einer Trinkgelegenheit konsumiert zu haben (sog. „binge drinking“) (Kraus, Pabst, Piontek, 2008). Häufige Folgen des episodisch exzessiven Alkoholkonsums im Kindes- und Jugendalter sind (Verkehrs-)unfälle, Gewalterfahrungen als Täter oder Opfer, ungewollte sexuelle Handlungen und Konflikte im sozialen Umfeld sowie Konflikte mit der Polizei (Champion et al., 2004; Hingson, Heeren, Zakocs, Winter, 2002; Sindelar, Barnett, Spirito, 2004; Miller, Naimi, Brewer, Jones, 2007). Neben den unmittelbaren Auswirkungen ist episodisch exzessiver Alkoholkonsum mit neurokognitiven Beeinträchtigungen, Beeinträchtigungen in der sozialen und akademischen Entwicklung sowie einem erhöhten Risiko der Entwicklung einer alkoholbezogenen Störung im Erwachsenenalter assoziiert (McQueeney et al., 2009; Heffernan, Clark, Bartholomew, Ling, Stephens, 2010; Grant u. Dawson, 1997; Miller et al., 2007).

1.2 Alkoholbezogene Kurzinterventionen

Kurzinterventionen werden häufig zur Prävention oder Frühintervention bei riskantem Alkoholkonsum im Kindes- und Jugendalter eingesetzt (Diestelkamp, Arnaud, Thomasius, 2014). Sie basieren oft auf den Prinzipien des Motivational Interviewing (MI) und sind gekennzeichnet durch eine empathische, partnerschaftliche therapeutische Beziehung und nicht-konfrontative Gesprächsführung. MI ist ein klientenzentrierter und direkter Beratungsstil mit dem Ziel der Auslösung und Förderung einer intrinsischen Motivation zur Verhaltensänderung (Miller u. Rollnick, 2002) und basiert in seinen Annahmen auf dem Transtheoretischen Modell der Verhaltensänderung (TTM) (Prochaska u. DiClemente, 1986, 1998). Nach dem TTM wird die aktuelle Motivation von Menschen als veränderbar und in unterschiedlichen Phasen verlaufend angesehen (Absichtslosigkeit, Absichtsbildung, Vorbereitung, Handlung und Aufrechterhaltung).

Eine Reihe von Studienergebnissen spricht für die Wirksamkeit von alkoholbezogenen Kurzinterventionen in verschiedenen Settings (McQueen et al., 2011; Kaner et al., 2007; Nilsen et al., 2008). Für das Kindes- und Jugendalter liegen deutlich weniger Studien vor und insbesondere hier zeichnet sich ein uneinheitliches Bild bezüglich der Wirksamkeit ab (Foxcroft, Coombes, Wood, Allen, Almeida Santimano, 2014; Newton et al., 2013; Wachtel u. Staniford, 2010; Diestelkamp, Drechsel, Arnaud, Baldus, Thomasius, 2016; Jensen et al., 2011; Yuma-Guerrero, Velasquez, von Sternberg, Maxson, Garcia, 2012). Eine mögliche Erklärung für die uneinheitliche Evidenzlage liegt in der Heterogenität der getesteten Interventionen. Die Analyse einzelner Elemente von Kurzinterventionen in Hinblick auf ihren Beitrag zur Effektivität ist daher ein wichtiger Schritt zur Förderung des Verständnisses über Wirkmechanismen von Kurzinterventionen und damit einhergehend zu einer möglichen Verbesserung ihrer Wirksamkeit (McCambridge, 2013).

1.3 Therapeutische Grundhaltung als Wirkfaktor

Die empathische und wertschätzende therapeutische Grundhaltung (der sogenannte „Geist des MI“) wird oft als zentraler Wirkfaktor im MI genannt. Diese Hypothese untersuchten McNally, Palfai und Kahler (2005) in einer Stichprobe amerikanischer College Studierender, die eine alkoholbezogene Kurzintervention erhielten. Sie fanden einen signifikanten Einfluss der wahrgenommenen Empathie des/der Beraters/ in auf den Alkoholkonsum sechs Wochen nach der Intervention. Auch Gaume, McGill et al. (2014) fanden in einer Stichprobe riskant Alkohol konsumierender 20-jähriger Männer einen signifikanten Zusammenhang zwischen besseren Bewertungen der MI Umsetzung (Akzeptanz, Empathie, Geist des MI) und der Reduktion des Alkoholkonsums. Andere Studien hingegen fanden diesen Zusammenhang nicht (Feldstein u. Forchimes, 2007; Bertholet, Palfai, Gaume, Daepfen, Saitz, 2014), wobei die Autoren anführen, dass die Interpretation der Studienergebnisse dadurch

erschwert wurde, dass die Varianz in den betrachteten Variablen der MI Umsetzung oft gering war.

1.4 MI-tools als Wirkfaktor

Neben der Umsetzung einer MI-kongruenten therapeutischen Grundhaltung wurde außerdem der Einfluss einzelner sogenannter „MI-tools“ auf die Wirksamkeit von alkoholbezogenen Kurzinterventionen untersucht. Unter dem Begriff MI-tools werden Instrumente zur Förderung der Veränderungsmotivation verstanden, die häufig in motivierenden Kurzinterventionen eingesetzt werden.

Motivationswaage. Die Motivationswaage ist ein im MI vielfach eingesetztes Instrument zur Exploration, Klärung und Förderung von Veränderungsmotivation (LaBrie, Pedersen, Earleywine, Olsen, 2006). Das Instrument basiert auf dem Modell zum Entscheidungsverhalten von Janis und Mann (1977), und besteht aus einer (oft grafischen) Exploration und Darstellung der Vor- und Nachteile einer Verhaltensänderung. Eine Metaanalyse von Carey, Scott-Sheldon, Carey und De Martini (2007), in der 62 kontrollierte Studien zur Wirksamkeit von Interventionen zur Alkoholprävention bei Studierenden untersucht wurden, fand, dass Interventionen, die den Einsatz der Motivationswaage beinhalteten, kurzfristig mit einer stärkeren Reduktion alkoholbezogener Probleme assoziiert waren. In einer eigenen Studie fanden Carey, Carey, Maisto und Henson (2006) jedoch keine stärkere Reduktion des Alkoholkonsums bei Studierenden, die eine motivierende Kurzintervention mit Motivationswaage erhalten hatten. Zwei Studien, die den Einsatz der Motivationswaage als alleinstehende Intervention testeten, fanden widersprüchliche Ergebnisse (Collins u. Carey, 2005; LaBrie et al., 2006). Eine jüngere Metaanalyse von Carey, Scott-Sheldon, Elliott, Garey und Carey (2012) fand sogar kleinere Effekte von Kurzinterventionen auf den Alkoholkonsum, wenn diese den Einsatz einer Motivationswaage beinhalteten.

Zielvereinbarung. Die Zielvereinbarung ist ein Element des MI, das eine Zusammenfassung des vorangegangenen motivationalen Dialogs in der Form einer Absichtserklärung darstellt und häufig als schriftlicher Vertrag über eine Verhaltensänderung festgehalten wird (Magill, Apodaca, Barnett, Monti, 2010). Eine MI Sitzung sollte nur dann mit einer Zielvereinbarung beendet werden, wenn der/die Klient/in eine Motivation zur Veränderung zeigt und bereits an Strategien der Verhaltensänderung gearbeitet wird (Phase 2 des MI) (Miller u. Rollnick, 2002). Lee et al. (2010) fanden, dass eine Zielvereinbarung von hoher Qualität ein signifikanter Prädiktor für reduzierten Alkoholkonsum zwölf Monaten nach einer Kurzintervention im Notfallsetting war. Die Autoren verglichen außerdem den Einfluss des Verfassens einer qualitativ hochwertigen Zielvereinbarung mit dem Einfluss der Veränderungsmotivation, die bereits vor der Kurzintervention bestand. Sie fanden, dass die Zielvereinbarung ein stärkerer Prädiktor für einen reduzierten Alkoholkonsum war. Gaume, Magill et al. (2014) wiesen jedoch darauf hin, dass das Beenden einer

Kurzintervention mit einer Zielvereinbarung auch als Endpunkt einer erfolgreichen Intervention interpretiert werden kann, im Gegensatz zu der von Lee et al. (2010) vorgeschlagenen Interpretation als Wirkfaktor.

Wichtigkeits- und Zuversichtsskala. Ein häufig eingesetztes MI-tool ist außerdem die Wichtigkeits- und Zuversichtsskala (Coleman u. Pasternak, 2012). Das von Stephen Rollnick entwickelte Instrument besteht aus einer visuellen Skala von 1-10, die die Stärke der Veränderungsmotivation bzw. der Selbstwirksamkeitsüberzeugung abbildet. Das Instrument kann einerseits zur Erhebung von Veränderungsmotivation und Selbstwirksamkeit eingesetzt werden und andererseits als Instrument zur Förderung des „change talk“, das heißt von Äußerungen des/der Klient/in, die für eine Veränderung sprechen (Miller, 1999). Der/die Klient/in soll angeregt werden zum/zur Fürsprecher/in der eigenen Veränderung zu werden, indem der/die Berater/in zunächst ressourcenorientiert exploriert, warum keine geringere Zahl auf der jeweiligen Skala gewählt wurde. Der Einfluss dieses MI-tools auf die Förderung von Veränderungsmotivation oder auf einen reduzierten Alkoholkonsum wurde unseres Wissens bislang nicht untersucht.

1.5 Fragestellung

In der vorliegenden Studie wurde der Einfluss wahrgenommener Berater/innenmerkmale (Empathie, Positive Wertschätzung, Expertise, Kongruenz) sowie der Einfluss des Einsatzes von MI-tools (Motivationswaage, Wichtigkeits- und Zuversichtsskala, Zielvereinbarung) auf die Veränderungsbereitschaft zur Reduktion des Alkoholkonsums in einer Stichprobe Kinder und Jugendlicher im Notfallsetting untersucht. Das Vorhandensein einer Veränderungsmotivation wird theoretisch als Voraussetzung für eine Verhaltensänderung angesehen (Miller u. Rollnick, 2002; Prochaska u. DiClemente, 1986). Auch empirisch wurde eine Veränderungsmotivation als Prädiktor für eine Reduktion des Alkoholkonsums bestätigt (Daepfen, Bertholet, Gmel, Gaume, 2007) und wurde daher in der vorliegenden Studie als Endpunkt gewählt. Im Sinne des MI wurde angenommen, dass insbesondere stärker wahrgenommene Empathie und Wertschätzung eine höhere Veränderungsbereitschaft vorhersagen. Aufgrund der uneinheitlichen oder fehlenden Evidenz wurden die MI-tools Motivationswaage und Wichtigkeits- und Zuversichtsskala explorativ untersucht. Schließlich wurde angenommen, dass Interventionen, die mit dem Verfassen einer Zielvereinbarung abgeschlossen wurden, mit einer höheren Veränderungsmotivation assoziiert sind.

2 Stichprobe und Methoden

2.1 Datenerhebung

Im Rahmen einer randomisiert-kontrollierten Studie („HaLT-Hamburg“)² zur Evaluation der Wirksamkeit einer motivierenden Kurzintervention zur Reduktion risikanten Alkoholkonsums wurden N = 316 Kinder und Jugendliche befragt, die aufgrund einer akuten Alkoholintoxikation notfallmedizinisch behandelt wurden. Die Studienteilnehmer/innen waren im Alter zwischen 12 und 17 Jahren und wurden in einer von sechs teilnehmenden Kliniken in Hamburg behandelt. Weitere Details zum Studiendesign wurden in Diestelkamp, Arnaud, Sack et al. (2014) beschrieben. In der vorliegenden Studie wurden die während des Klinikaufenthaltes erhobenen Daten der Jugendlichen in der Interventionsgruppe (N = 141) ausgewertet.

Kinder und Jugendliche, die mit einer akuten Alkoholintoxikation zwischen Juli 2011 und Januar 2014 in einer der teilnehmenden Kliniken behandelt wurden, wurden am darauffolgenden Tag zwischen 7 und 9 Uhr zunächst von einer studentischen Hilfskraft aufgesucht, die die Einschlusskriterien (Einlieferung aufgrund einer akuten Alkoholintoxikation, keine schweren Verletzungen, ausreichendes Sprachverständnis, ausreichende mental-kognitive Aufnahmebereitschaft) prüfte und die Einwilligung des/der Jugendlichen und gegebenenfalls eines Erziehungsberechtigten einholte. Die studentische Hilfskraft informierte dann eine/n Berater/in, der/die eine motivierende Kurzintervention am Krankenbett durchführte und mit den Eltern eine Elternintervention durchführte.

2.2 Intervention

Die etwa 45-minütige manualisierte motivierende Kurzintervention basierte auf den Prinzipien der Motivierenden Gesprächsführung nach Miller u. Rollnick (2002) und integrierte Elemente des sogenannten „Brückengesprächs“ des Programms HaLT – Hart am Limit (Villa Schöpflin, 2008) sowie der motivierenden Kurzintervention nach Spirito et al. (2004). Die motivierende Kurzintervention gliederte sich in die Phasen Gesprächseinstieg, halbstrukturiertes Interview, Exploration, Zusammenfassen und Klären sowie den Gesprächsabschluss. Zum Einsatz am Krankenbett kam eine sogenannte Memokarte, die als Orientierungshilfe für Struktur und Inhalt der Intervention von den Berater/innen während der Intervention genutzt wurde.

² *Danksagung:* Die Studie „HaLT-Hamburg“ wurde in Kooperation mit der Behörde für Gesundheit und Verbraucherschutz der Freien und Hansestadt Hamburg (BGV) durchgeführt und stellte unter dem Titel „Gesundheitsnetz Alkohol im Jugendalter – Verbesserung des Behandlungszugangs für risikant Alkohol konsumierende Jugendliche“ ein Teilprojekt des Forschungsprojektes „psychnet“ dar. „psychnet – Hamburger Netz psychische Gesundheit“ ist ein vom Bundesministerium für Bildung und Forschung (BMBF-Förderkennzeichen: O1KQ1002B) von 2011 bis 2015 gefördertes Projekt, mit dem die Stadt Hamburg 2010 den Titel „Gesundheitsregion der Zukunft“ erhalten hat.

Die Eltern erhielten eine Intervention, die in Anlehnung an das Konzept zum Elterntraining suchtgefährdeter Jugendlicher nach Stolle, Petersen und Thomasius (2010) konzipiert wurde. Abschließend erhielten die Eltern und der/die Jugendliche die Empfehlung ein weiterführendes Beratungsangebot in einer jugendspezifischen Suchtberatungsstelle in Anspruch zu nehmen. Außerdem bekamen die Jugendlichen eine Informationsmappe ausgehändigt, in der unter anderem Informationen über Regeln für einen risikoarmen Alkoholkonsum zu finden waren sowie die Informationsbroschüre der empfohlenen Suchtberatungsstelle.

2.3 Auswahl der Berater/innen

Als Berater/innen kamen Psycholog/innen ($n = 4$) und Sozialpädagog/innen ($n = 1$) zum Einsatz, die in einer zwölfstündigen Schulung in motivierender Gesprächsführung und in der Anwendung des Interventionsmanuals geschult wurden. Während der Studienlaufzeit nahmen die Berater/innen alle zwei Monate an einer Supervisionen teil. In der vorliegenden Studie wurden Daten derjenigen Berater/innen ausgewertet, die während der Studienlaufzeit mehr als fünf Interventionen durchgeführt haben.

2.4 Messinstrumente

Studienteilnehmer/innen füllten im Anschluss an die Intervention einen circa 20-minütigen Fragebogen aus, der unter anderem Daten zur Soziodemografie (Alter, Geschlecht, Schulbildung, Migrationshintergrund) und zum Substanzkonsum erfasste. Eine detaillierte Beschreibung der Messinstrumente findet sich in Diestelkamp, Arnaud, Sack et al. (2014).

Veränderungsmotivation. Zur Erhebung der Veränderungsmotivation beantworteten Studienteilnehmer/innen in Anlehnung an Heidenreich und Hoyer (2001) die Frage „Im Folgenden geht es um Deine Einschätzung Deines zukünftigen Umgangs mit Alkohol. Bitte kreuze an, welche der folgenden drei Situationen Dich im Moment am besten beschreibt“. Als Antwortoptionen gab es drei Aussagen, die die Phasen der Veränderungsbereitschaft Absichtslosigkeit („Ich trinke Alkohol und will daran nichts ändern“), Absichtsbildung („Ich trinke Alkohol, aber ich habe darüber nachgedacht, weniger zu trinken“) und Vorbereitung („Ich trinke noch Alkohol, aber ich habe mich fest entschlossen, weniger Alkohol zu trinken“) abbildeten.

Therapeutische Basiskompetenzen. Die Skala „therapeutische Basiskompetenzen“ der Bedürfnisorientierten Interaktionsskalen (BIS) (Stucki, 2004) wurde eingesetzt, um die vier Dimensionen „Empathie“, „Kongruenz“, „Positive Wertschätzung“ und „Expertise“ des therapeutischen Beziehungsverhaltens aus Patientensicht zu erheben. Studienteilnehmer/innen gaben den Grad ihrer Zustimmung zu acht Items (z. B. „Der Berater bzw. die Beraterin wirkt echt“, „Der Berater bzw. die Beraterin akzeptiert mich“) auf einer vierstufigen Ratingskala („0 = stimmt überhaupt nicht“ bis „3 = stimmt genau“) an.

Einsatz von MI-tools. Der Einsatz von MI-tools (Motivationswaage, Wichtigkeits- und Zuversichtsskala, schriftliche Zielvereinbarung) wurde von den Berater/innen nach der Intervention in einem dichotomen (1 = ja/2 = nein) Antwortformat angegeben.

2.5 Auswertungsstrategie

Zur Testung des Zusammenhangs zwischen Veränderungsmotivation und therapeutischen Basiskompetenzen sowie eingesetzten MI-tools wurde eine schrittweise multiple lineare Regression mit Veränderungsmotivation als abhängiger Variable berechnet. Alter und Geschlecht der Berater/innen sowie Alter und Geschlecht der Jugendlichen wurden als Kontrollvariable in das Modell mit aufgenommen. Die statistischen Analysen erfolgten mit der Software SPSS Version 23.0 (SPSS Inc, 2013, Chicago, IL, USA).

3 Ergebnisse

3.1 Stichprobe

N = 141 Jugendliche (50.4 % männlich) im Alter zwischen 12 und 17 Jahren ($M = 15.7$, $SD = 1.16$) erhielten eine motivierende Kurzintervention am Krankenbett und nahmen an der Befragung teil (vgl. Tab. 1, folgende Seite). Die Teilnehmer/innen gaben nach der Intervention eine mittlere Veränderungsmotivation von $M = 2.56$ ($SD = .62$) an. Davon ordneten sich 5.7 % der Phase der Absichtslosigkeit zu, 22.7 % der Phase der Absichtsbildung und 64.5 % der Phase der Vorbereitung.

3.2 Berater/innen- und Interventionsmerkmale

Im Rahmen dieser Studie wurden die Daten von $N = 5$ Berater/innen ausgewertet, von denen drei weiblich und zwei männlich waren mit einem mittleren Alter von 41.6 Jahren ($SD = 9.7$) (Tab. 2). Die Umsetzung der therapeutischen Basiskompetenzen durch die Berater/innen wurde von den Jugendlichen im Mittel mit 2.5 (Empathie) bis 2.8 (Kongruenz und Positive Wertschätzung) eingeschätzt. Für die Gesamtskala „therapeutische Basiskompetenzen“ ergab sich eine sehr gute Reliabilität von Cronbachs $\alpha = .908$. Für die eingesetzten Subskalen ergaben sich für die Dimensionen Empathie (Cronbachs $\alpha = .712$), Kongruenz (Cronbachs $\alpha = .694$), Expertise (Cronbachs $\alpha = .762$) und positive Wertschätzung (Cronbachs $\alpha = .825$) akzeptable Reliabilitäten.

Am häufigsten setzten die Berater/innen die Wichtigkeits- und Zuversichtsskalen ein (in 64.5 % der durchgeführten Interventionen), gefolgt von der schriftlichen Formulierung einer Zielvereinbarung (58.9 %) und dem Einsatz der Motivationswaage (39.7 %). Bivariate Korrelationen ergaben statistisch signifikante Zusammenhänge zwischen höheren Ausprägungen der vier therapeutischen Basiskompetenzen mit einer höheren Veränderungsmotivation sowie zwischen dem Einsatz der Zuversichtsskala und dem

Formulieren einer schriftlichen Zielvereinbarung mit einer höheren Veränderungsmotivation (Tab. 2, folgende Seite).

Tabelle 1: Deskriptive Daten zur Beschreibung der Stichprobe (N = 141)

	Mittelwert/Häufigkeit	Standardabweichung/%
Alter ^a	15.71	1.16
Geschlecht ^b		
weiblich	70	49.6 %
männlich	71	50.4 %
Schulbesuch (ja) ^b		
Gymnasium	41	29.1 %
Fachoberschule	1	0.7 %
Gesamtschule/Stadteilschule	48	34 %
Realschule	11	7.8 %
Haupt-/Volksschule	6	4.3 %
Förderschule	6	4.3 %
Migrationshintergrund ^b		
Vater in einem anderen Land geboren	46	32.6 %
Mutter in einem anderen Land geboren	36	25.5 %
Positives Screening für riskanten Alkoholkonsum (CRAFFT-d \geq 2) ^{b,c}	83	58.8 %
Substanzkonsum ^b		
3-Monats Prävalenz Nikotinkonsum	96	68.1 %
3-Monats Prävalenz Cannabiskonsum	49	34.8 %
3-Monats Prävalenz andere illegale Drogen	5	3.5 %
Veränderungsmotivation ^a	2.56	.62

^a Deskriptive Statistiken für intervallskalierte Variablen sind Mittelwert (Standardabweichung);

^b Deskriptive Statistiken für kategoriale Variablen sind Häufigkeiten (%); ^c Tossmann et al. (2009)

3.3 Einflüsse von Berater/innen- und Interventionsmerkmalen auf die Veränderungsmotivation

Die multivariate Analyse des Einflusses der erhobenen Variablen auf die Veränderungsmotivation der Jugendlichen in einem Regressionsmodell ergab statistisch signifikante Einflüsse der therapeutischen Basiskompetenz „Positive Wertschätzung“ mit einer Varianzaufklärung von 7.1 % und des MI-tools „schriftliche Zielvereinbarung“ mit einer Varianzaufklärung von 2.9 % (Tab. 3, folgende Seite). Außerdem zeigte sich, dass ein geringeres Alter der Jugendlichen mit einer höheren Veränderungsbereitschaft einherging (Varianzaufklärung 10.2 %). Insgesamt konnte durch die im Modell eingeschlossenen Variablen eine Varianz von 20.2 % aufgeklärt werden ($R^2 = .202$, $F = 9.34$, $p < .001$). Multikollinearität zwischen den drei im Modell eingeschlossenen Variablen war niedrig mit Varianzinflationsfaktoren (VIF) zwischen 1.00-1.05 und Toleranzwerten (T) zwischen .95 - .99 (Kutner, Nachtsheim, Neter, 2004). Das Geschlecht

Tabelle 2: Deskriptive Daten und Korrelationen der Berater/innen- und Interventionsmerkmale mit der Veränderungsmotivation

	Deskriptive Mittelwert (SD)/ N (%)	Korrelationen Veränderungsmotivation
Berater/innenmerkmale		
Geschlecht Berater/innen ^b		
Weiblich	3 (60 %)	.07
Männlich	2 (40 %)	
Alter Berater/innen ^a	41.6 (9.7)	-.08
Empathie ^a	2.5 (0.6)	.24**
Kongruenz ^a	2.8 (0.4)	.16*
Expertise ^a	2.7 (0.5)	.22**
Positive Wertschätzung ^a	2.8 (0.4)	.27**
Interventionsmerkmale		
Einsatz der Motivationswaage ^b	56 (39.7 %)	-.11
Einsatz der Zuversichtsskala ^b	91 (64.5 %)	-.17*
Einsatz der Wichtigkeitsskala ^b	91 (64.5 %)	-.04
Schriftliche Zielvereinbarung ^b	83 (58.9 %)	-.23**

^a Deskriptive Statistiken für intervallskalierte Variablen sind Mittelwert (Standardabweichung);

^b Deskriptive Statistiken für kategoriale Variablen sind Häufigkeiten (%) Signifikanzniveau: *p < .05; **p < .01; ***p < .001

Tabelle 3: Einfluss der Berater/innen- und Interventionsmerkmale auf die Veränderungsmotivation

	β_1	P	Änderung R ²
Berater/innenmerkmale			
Empathie	.14	.18	-
Kongruenz	.00	.99	-
Expertise	.14	.17	-
Positive Wertschätzung	.27	.002**	.071
Interventionsmerkmale			
Einsatz der Motivationswaage	-.08	.37	-
Einsatz der Zuversichtsskala	-.10	.28	-
Einsatz der Wichtigkeitsskala	.01	.95	-
Schriftliche Zielvereinbarung	-.17	.048*	.029
Kontrollvariablen			
Alter Jugendliche/r	-.28	.002**	.102
Geschlecht Jugendliche/r	.06	.50	-
Alter Berater/in	-.09	.30	-
Geschlecht Berater/in	.13	.14	-

Multiple lineare Regression; Signifikanzniveau: *p < .05; **p < .01; ***p < .001

der/der Beraters/in hatte in der vorliegenden Studie keinen statistisch signifikanten Einfluss auf die Veränderungsbereitschaft zur Reduktion des Alkoholkonsums.

4 Diskussion

In der vorliegenden Studie wurde erstmals der Einfluss von Berater/innen- und Interventionsmerkmalen auf die Motivation zur Reduktion des Alkoholkonsums bei Kindern und Jugendlichen nach akuter Alkoholintoxikation im Notfallsetting untersucht. Die bivariaten Analysen zeigten, dass höhere Ausprägungen aller vier therapeutischen Basiskompetenzen mit einer höheren Veränderungsbereitschaft einhergingen. Der Einsatz der Zuversichtsskala und das Beenden der Intervention mit einer schriftlichen Zielvereinbarung waren ebenfalls mit einer höheren Veränderungsmotivation assoziiert. Die multivariate Analyse zeigte, dass unter den betrachteten Interventions- und Berater/innenmerkmalen insbesondere die positive Wertschätzung mit einer höheren Motivation zur Reduktion des Alkoholkonsums assoziiert war. Auch das Beenden der Intervention mit einer schriftlichen Zielvereinbarung war mit einer höheren Veränderungsmotivation assoziiert, wobei sich der Einfluss als deutlich geringer erwies. Diese Ergebnisse stützen die wenigen Befunde, die es zu potenziellen Wirkmechanismen von Alkoholkurzinterventionen gibt. Der bedeutsame Einfluss der „MI skills“ (Akzeptanz, Empathie und „MI spirit“) wurde auch von Gaume, McCambridge, Bertholet, Daepfen (2014) gefunden. Sie analysierten Audioaufzeichnungen von N = 174 Kurzinterventionen mit riskant Alkohol konsumierenden Männern im Alter von 20 Jahren und fanden, dass eine MI-kongruente Grundhaltung des/der Therapeuten/in einen signifikanten Einfluss auf die Reduktion des Alkoholkonsums zwölf Monate nach der Intervention hatte. Daepfen, Bertholet und Gaume (2010) kamen nach ihrer Analyse von N = 367 Alkoholkurzinterventionen im Notfallsetting ebenfalls zu dem Schluss, dass eine MI-kongruente therapeutische Grundhaltung („MI attitude“) einer der wichtigsten Wirkfaktoren war.

Interessanterweise war die positive Wertschätzung in der multivariaten Auswertung ein signifikanter Prädiktor für die Veränderungsbereitschaft, während die Empathie des/der Beraters/in aus Patientensicht entgegen der formulierten Erwartungen keinen Einfluss hatte. Auch der Befund, dass das Beenden der Intervention mit einer Zielvereinbarung ein Prädiktor für eine höhere Veränderungsmotivation war, steht im Einklang mit Befunden vorangegangener Studien (Lee et al., 2010). Allerdings klärt diese Variable in der multivariaten Betrachtung lediglich 2.9 % der Gesamtvarianz auf, und es ist zu beachten, dass dieses Element der Intervention auch als Indikator für eine Veränderungsmotivation gesehen werden kann, im Gegensatz zu der Annahme, dass es sich hierbei um einen Wirkfaktor handelt. Das Alter der Kinder und Jugendlichen zum Zeitpunkt der Intervention war korreliert mit der Veränderungsmotivation, in dem Sinne, dass jüngere Patienten/innen eine höhere Veränderungsmotivation berichteten. Das Alter der Kinder und Jugendlichen blieb auch in der multivariaten Analyse mit 10.2 % Varianzaufklärung der stärkste Prädiktor für eine höhere Veränderungsmotivation. Dieser

Befund gibt Hinweise darauf, dass insbesondere jüngere Patientinnen und Patienten nach einer Alkoholintoxikation von einem Beratungsangebot in der Klinik profitieren.

Folgende Limitationen der vorliegenden Studie sollten berücksichtigt werden. Die Veränderungsmotivation der Jugendlichen wurde während des Klinikaufenthaltes einmalig nach der Intervention erhoben, weshalb keine Informationen zur Veränderungsmotivation vor der Intervention vorlagen, die eine Adjustierung um Baseline-Unterschiede zugelassen hätte. Die Entscheidung zugunsten einer einmaligen Erhebung post interventionem fiel aus therapeutischen Überlegungen, um die Belastung der Jugendlichen durch die Befragung möglichst gering zu halten und eine größtmögliche kognitive Aufnahmebereitschaft während der Intervention zu ermöglichen. Audioaufzeichnungen der Interventionen wurden in dieser Studie nicht durchgeführt, weshalb ein objektives Rating der MI skills durch Dritte nicht möglich war. MI skills Ratings werden häufig in Studien eingesetzt, in denen neben der therapeutischen Grundhaltung weitere Mikroskills, wie z. B. die Häufigkeit des Einsatzes von offenen Fragen oder einfachem und komplexem Widerspiegeln, analysiert werden (Gaume et al., 2014). Da in der vorliegenden Studie die durch den/die Patienten/in wahrgenommenen MI skills der Beraterin/des Beraters untersucht wurden, erschien ein Rating durch die Patient/innen jedoch angemessen. Die vorliegende Studie untersuchte eine Stichprobe von Kindern und Jugendlichen, die in sechs Hamburger Kliniken aufgrund einer Alkoholintoxikation behandelt wurden. Die Generalisierbarkeit der Ergebnisse, beispielsweise auf den ländlichen Raum, ist daher noch offen. Ebenso wäre es wünschenswert, in Zukunft größere Stichproben mit einer größeren Anzahl von Berater/innen zu untersuchen, um die in dieser Studie gefundenen Ergebnisse zu validieren. Zukünftige Forschung könnte neben einer größeren Bandbreite von Berater/innen sensitivere Instrumente einsetzen, um noch bessere Einblicke in unterschiedliche Ausprägungen der MI skills und deren Zusammenhang mit der Wirksamkeit von Kurzinterventionen zu bekommen.

Fazit für die Praxis

Diese Studie ist ein wichtiger Beitrag zu der wachsenden Literatur zum Einfluss von Berater/innen- und Interventionsmerkmalen auf die Wirksamkeit von alkoholbezogenen Kurzinterventionen für Kinder und Jugendliche und liefert wichtige Hinweise für die Ausbildung von Berater/innen und die Gestaltung von Interventionen für diese Zielgruppe. Insbesondere die wahrgenommene positive Wertschätzung durch den/die Berater/in trägt bei Kindern und Jugendlichen nach akuter Alkoholintoxikation zu einer höheren Veränderungsmotivation für einen reduzierten Alkoholkonsum bei. Der Einsatz spezieller MI-tools hat einen vergleichsweise geringen Einfluss. Die Ausbildung von Berater/innen, die Kurzinterventionen für diese Zielgruppe durchführen, sollte ein besonderes Augenmerk auf die Förderung einer MI-kongruenten therapeutischen Grundhaltung im Sinne einer positiven Wertschätzung der Kinder und Jugendlichen legen.

Literatur

- Bertholet, N., Palfai, T., Gaume, J., Daeppen, J.-B., Saitz, R. (2014). Do brief alcohol motivational interventions work like we think they do? *Alcoholism, clinical and experimental research*, 38, 853-859.
- Carey, K. B., Scott-Sheldon, L. A., Elliott, J. C., Garey, L., Carey, M. P. (2012). Face-to-face versus computer-delivered alcohol interventions for college drinkers: A meta-analytic review, 1998 to 2010. *Clinical psychology review*, 32, 690-703.
- Carey, K. B., Scott-Sheldon, L. A., Carey, M. P., DeMartini, K. S. (2007). Individual-level interventions to reduce college student drinking: a meta-analytic review. *Addictive behaviors*, 32, 2469-2494.
- Carey, K. B., Carey, M. P., Maisto, S. A., Henson, J. M. (2006). Brief motivational interventions for heavy college drinkers: A randomized controlled trial. *Journal of consulting and clinical psychology*, 74, 943-954.
- Champion, H. L. O., Foley, K. L., DuRant, R. H., Heather, L.O., Hensberry, R., Altman, D., Wolfson, M. (2004). Adolescent sexual victimization, use of alcohol and other substances, and other health risk behaviors. *Journal of adolescent health*, 35, 321-328.
- Coleman, M. T., Pasternak, R. H. (2012). Effective strategies for behaviour change. *Primary care: Clinics in office practice*, 39, 281-305.
- Collins, S. E., Carey, K. B. (2005). Lack of effect for decisional balance as a brief motivational intervention for at-risk college drinkers. *Addictive behaviors*, 30, 1425-1430.
- Daeppen, J.-B., Bertholet, N., Gaume, J. (2010). What process research tells us about brief intervention efficacy. *Drug and alcohol review*, 29, 612-616.
- Daeppen, J.-B., Bertholet, N., Gmel, G., Gaume, J. (2007). Communication during brief intervention, intention to change, and outcome. *Substance abuse*, 28, 43-51.
- Diestelkamp, S., Arnaud, N., Thomasius, R. (2014). Alkohol im Kindes- und Jugendalter Epidemiologie, Früherkennung und Behandlung schädlicher Konsummuster. *Pädiatrie up2-date*, 09, 15-37.
- Diestelkamp, S., Arnaud, N., Sack, P.-M., Wartberg, L., Daubmann, A., Thomasius, R. (2014). Brief motivational intervention for adolescents treated for acute alcohol intoxication in the emergency department – a randomized-controlled trial. *BMC emergency medicine*, 14, 13.
- Diestelkamp, S., Drechsel, M., Arnaud, N., Baldus, C., Thomasius, R. (2016). Brief in person interventions for adolescents and young adults following alcohol-related events in emergency care: A systematic review and european evidence synthesis. *European addiction research*, 22, 17-35. DOI: 10.1159/000435877.
- Feldstein, S. W., Forcehimes, A. A. (2007). Motivational interviewing with underage college drinkers: A preliminary look at the role of empathy and alliance. *American journal of drug and alcohol abuse*, 33, 737-746.
- Foxcroft, D. R., Coombes, L., Wood, S., Allen, D., Almeida Santimano, N. M. L. (2014). Motivational interviewing for alcohol misuse in young adults. *Cochrane Database of Systematic Reviews*, 8, CD007025.
- Gaume, J., Magill, M., Longabaugh, R., Bertholet, N., Gmel, G., Daeppen, J.-B. (2014). Influence of counsellor characteristics and behaviors on the efficacy of a brief motivational intervention for heavy drinking in young men – a randomized controlled trial. *Alcoholism, clinical and experimental research*, 38, 2138-2147.

- Gaume, J., McCambridge, J., Bertholet, N., Daepfen, J.-B. (2014). Mechanisms of action of brief alcohol interventions remain largely unknown – a narrative review. *Frontiers in psychiatry*, 5, 1-9.
- Grant, B., Dawson, D. (1997). Age of onset of alcohol use and its association with DSM-IV alcohol abuse and dependence. Results from the National Longitudinal Alcohol Epidemiologic Survey. *Journal of substance abuse and alcoholism*, 9, 103-110.
- Heffernan, T., Clark, R., Bartholomew, J., Ling, J., Stephens, S. (2010). Does Binge Drinking in Teenagers affect their Everyday Prospective Memory? *Drug and alcohol dependence*, 109, 73-78.
- Heidenreich, T., Hoyer, J. (2001). Stadien der Veränderung bei Substanzmissbrauch und -abhängigkeit: Eine methodenkritische Übersicht. *Sucht*, 47, 158-170.
- Hibell, B., Guttormsson, U., Ahlström, S., Balakireva, O., Bjarnason, T., Kokkevi, A., Kraus L. (2012). The 2011 ESPAD Report. Substance use among students in 36 European Countries. Zugriff am 3.11.2012 unter: http://www.espad.org/Uploads/ESPAD_reports/2011/The_2011_ESPAD_Report_FULL_2012_10_29.pdf.
- Hingson, R. W., Heeren, T., Zakocs, R., Winter, M. (2002). Age of first intoxication, heavy drinking, driving after drinking and risk of unintentional injury. *Journal of studies on alcohol*, 63, 136-144.
- Janis, I. L., Mann, L. (1977). *Decision making: A psychological analysis of conflict, choice, and commitment*. London: Cassel & Collier Macmillan.
- Jensen, C. D., Cushing, C. C., Aylward, B. S., Craig, J. T., Sorell, D. M., Steele, R. G. (2011). Effectiveness of motivational interviewing interventions for adolescent substance use behavior change: A meta-analytic review. *Journal of Consulting and Clinical Psychology*, 79, 433-440.
- Kaner, E. F., Beyer, F. R., Dickinson, H. O., Pienaar, E., Campbell, F., Schlesinger, C., Heather, N., Saunders, J., Burnand, B. (2007). Effectiveness of brief alcohol interventions in primary care populations. *Cochrane Database of Systematic Reviews*, 2, CD004148.
- Kraus, L., Pabst, A., Piontek, D. (2008). *Europäische Schülerstudie zu Alkohol und anderen Drogen 2007 (ESPAD). Befragung von Schülerinnen und Schülern der 9. und 10. Klasse in Bayern, Berlin, Brandenburg, Mecklenburg-Vorpommern und Thüringen*. München: IFT Institut für Therapieforchung; 2008.
- Kutner, M. H., Nachtsheim, C. J., Neter, J. (2004). *Applied Linear Regression Models (4. Aufl.)*. McGraw-Hill Irwin.
- LaBrie, J. W., Pedersen, E. R., Earleywine, M., Olsen, H. (2006). Reducing heavy drinking in college males with the decisional balance: analysing an element of motivational interviewing. *Addictive behaviors*, 31, 254-63.
- Lee, C. S., Baird, J., Longabaugh, R., Nirenberg, T. D., Mello, M. J., Woolard, R. (2010). Change plan as an active ingredient of brief motivational interventions for reducing negative consequences of drinking in hazardous drinking emergency-department patients. *Journal of studies on alcohol and drugs*, 71, 726-733.
- Magill, M., Apodaca, T. R., Barnett, N. P., Monti, P. M. (2010). The route to change: within-session predictors of change plan completion in a motivational interview. *Journal of substance abuse treatment*, 38, 299-305.
- McCambridge, J. (2013). Brief intervention content matters. *Drug and alcohol review*, 32, 339-341.
- McNally, A. M., Palfai, T. P., Kahler, C. W. (2005). Motivational interventions for heavy drinking college students: examining the role of discrepancy-related psychological processes. *Psychology of addictive behaviors*, 19, 79-87.

- McQueen, J., Howe, T. E., Allan, L., Mains, D., Hardy, V. (2011). Brief interventions for heavy alcohol users admitted to general hospital wards. *Cochrane Database of Systematic Reviews* 2011, 8, Art. No., CD005191.
- McQueeny, T., Schweinsburg, B. C., Schweinsburg, A. D., Jacobus, J., Bava, S., Frank, L. R., Ta-pert, S. F. (2009). Altered white matter integrity in adolescent binge drinkers. *Alcoholism: Clinical and experimental research*, 33, 1278-1285.
- Miller, J. W., Naimi, T.S., Brewer, R. D., Jones, S. E. (2007). Binge drinking and associated health risk behaviours among high school students. *Pediatrics*, 119, 76-85.
- Miller, W. R. (1999). Enhancing motivation for change in substance abuse treatment: treatment improvement protocol (TIP) Series 35. Rockville: U.S. Department of health and human services.
- Miller, W.R., Rollnick, S. (2002). *Motivational interviewing. Preparing people for change.* New York: Guilford.
- Newton, A.S., Dong, K., Mabood, N., Ata, N., Ali, S., Gokiart, R., Vandermeer, B., Tjosvold, L., Hartling, L., Wild, T. C. (2013). Brief emergency department interventions for youth who use alcohol and other drugs: a systematic review. *Pediatric emergency care*, 29, 673-84.
- Nilsen, P., Baird, J., Mello, M. J., Nirenberg, T., Woolard, R., Bendtsen, P., Longabaugh, R. (2008). A systematic review of emergency care brief alcohol interventions for injury patients. *Journal of substance abuse treatment*, 35, 184-201.
- Prochaska, J. O., DiClemente, C. C. (1986). Towards a comprehensive model of change. In W. R. Miller, N. Heather (Hrsg.), *Treating addictive behaviors* (S. 3-28). New York: Plenum Press.
- Prochaska, J. O., DiClemente, C. C. (1998). The Transtheoretical Model of change. In W. R. Miller, N. Heather (Hrsg.), *Treating addictive behaviours* (S. 3-24). New York: Plenum Press.
- Sindelar, H., Barnett, N. P., Spirito, A. (2004). Adolescent alcohol use and injury: A summary and critical review of the literature. *Minerva pediatrica*, 56, 291-309.
- Spirito, A., Monti, P. M., Barnett, N. P., Colby, S. M., Sindelar, H., Rohsenow, D. J., Lewander, W., Myers, M. (2004). A randomized clinical trial of a brief motivational intervention for alcohol-positive adolescents treated in an emergency department, *The Journal of pediatrics*, 396-402.
- SPSS Inc (2013). *SPSS Version 23.* Chicago, IL, USA
- Stolle, M., Petersen, K. U., Thomasius, R. (2010). *Entwicklung und Evaluation eines Trainingsprogramms für Eltern suchtgefährdeter Kinder und Jugendlicher.* Hamburg: Unveröffentlichte Antragsskizze, Universitätsklinikum Hamburg-Eppendorf.
- Stucki, C. (2004). *Die Therapiebeziehung differentiell gestalten. Intuitive Reaktionen, Patientenwahrnehmung und Beziehungsverhalten von Therapeuten in der Psychotherapie.* Universität Bern: http://www.zb.unibe.ch/download/eldiss/04stucki_c.pdf.
- Tossmann, P., Kasten, L., Lang, P., Strüber, E. (2009). Bestimmung der konkurrenten Validität des CRAFFT-d. Ein Screeninginstrument für problematischen Alkoholkonsum bei Jugendlichen. *Zeitschrift für Kinder- und Jugendpsychiatrie und Psychotherapie*, 37, 451-459.
- Villa Schöpflin (Hrsg) (2008). *Bundesmodellprojekt HaLT. Handbuch: Trainer-Manual und Projektdokumentation.* Schopfheim: Print Media Works.
- Wachtel, T., Staniford, M. (2010). The effectiveness of brief interventions in the clinical setting in reducing alcohol misuse and binge drinking in adolescents: A critical review of the literature. *Journal of clinical nursing*, 19, 605-620.
- Yuma-Guerrero, P. J., Velasquez, M. M., von Sternberg, K., Maxson, T., Garcia, N. (2012). Screening, brief intervention, and referral for alcohol use in adolescents: A systematic review. *Pediatrics*, 130, 115-122.

Korrespondenzanschrift: Silke Diestelkamp, Deutsches Zentrum für Suchtfragen des Kindes- und Jugendalters, Universitätsklinikum Hamburg-Eppendorf, 20246 Hamburg; E-Mail: s.diestelkamp@uke.de

Silke Diestelkamp, Lutz Wartberg, Nicolas Arnaud und Rainer Thomasius, Deutsches Zentrum für Suchtfragen des Kindes- und Jugendalters, Universitätsklinikum Hamburg-Eppendorf

APPENDIX II

Complete list of author's publications

Note: Citations are listed in chronological order, beginning with the most recent publication. Publications which are part of this dissertation are marked in grey.

Publications in peer-reviewed journals

Diestelkamp S, Wartberg L, Arnaud N, Thomasius R (2016). Einfluss von Berater/-innen- und Interventionsvariablen auf die Veränderungsmotivation von Kindern und Jugendlichen nach einer motivierenden Kurzintervention zur Reduktion riskanten Alkoholkonsums. [Influence of counsellor- and intervention variables on motivation to change in children and adolescents following a brief motivational intervention to reduce risky alcohol use]. *Praxis der Kinderpsychologie und Kinderpsychiatrie*, 65, 534-549.

Wartberg, L., **Diestelkamp, S.**, Arnaud, N. & Thomasius, R. (2016). Psychosoziale Merkmale von Jugendlichen, die wegen einer Alkoholintoxikation im Krankenhaus behandelt wurden. *Praxis der Kinderpsychologie und Kinderpsychiatrie*, 65, 516-533.

Arnaud, N., **Diestelkamp, S.**, Wartberg, L., Sack, P. M., Daubmann, A., & Thomasius, R. (2017). Short- to Midterm Effectiveness of a Brief Motivational Intervention to Reduce Alcohol Use and Related Problems for Alcohol Intoxicated Children and Adolescents in Pediatric Emergency Departments: A Randomized Controlled Trial. *Academic Emergency Medicine*, 24, 186-200.

Wartberg, L., Kriston, L., **Diestelkamp, S.**, Arnaud, N. & Thomasius, R. (2016). Psychometric properties of the German version of the CRAFFT. *Addictive Behaviors*, 59, 42-47.

Diestelkamp S, Drechsel M, Arnaud N, Baldus C, Thomasius R (2016). Brief In Person Interventions for Adolescents and Young Adults following Alcohol-related Events in Emergency Care: A Systematic Review and European Evidence Synthesis. *European Addiction Research*, 22, 17-35.

Diestelkamp, S., Kriston, L., Arnaud, N., Wartberg, L., Sack, P. M., Härter, M., & Thomasius, R. (2015). Drinking patterns of alcohol intoxicated adolescents in the emergency department: a latent class analysis. *Addictive Behaviors*, 50, 51-59.

Arnaud, N., **Diestelkamp, S.**, Wartberg, L., Sack, P. M., Lammers, K., Kammerahl, S., & Thomasius, R. (2015). Nachhaltiger Transfer des Gesundheitsnetz Alkohol im Jugendalter: Eine Kooperation aus Forschung, Praxis und Politik. *Psychiatrische Praxis*, 42, Suppl1, S35-S38.

Diestelkamp, S., Arnaud, N., Sack, P. M., Wartberg, L., Daubmann, A., & Thomasius, R. (2014). Brief Motivational Intervention for Adolescents Treated for Acute Alcohol Intoxication in the Emergency Department – a Randomized-Controlled Trial. *BMC Emergency Medicine*, 14, 13.

Diestelkamp, S., Arnaud, N., & Thomasius, R. (2014). Alkohol im Kindes- und Jugendalter – Epidemiologie, Früherkennung und Behandlung schädlicher Konsummuster. *Pädiatrie up2date*, 09(01), 15-37.

Diestelkamp, S., & Thomasius, R. (2014). Alkoholmissbrauch im Kindes- und Jugendalter. *Kinder- und Jugendarzt*, 45 (10), 544-550.

Sack, P. M., **Diestelkamp, S.**, Küstner, U., & Thomasius, R. (2012). Gesundheitsnetz "Alkoholmissbrauch im Jugendalter": Verbesserung des Behandlungszugangs für Kinder und Jugendliche mit riskantem Alkoholkonsum. *Suchttherapie*, 13(1), 33-36.

Book publications and chapters in books

Diestelkamp, S. & Thomasius, R. (2017). *Risikanters Alkoholkonsum bei Jugendlichen. Manual zur Durchführung einer motivierenden Kurzintervention*. Berlin, Heidelberg: Springer.

Diestelkamp, S., Aden, A., & Thomasius, R. (2014). ADHS und Sucht im Kindes- und Jugendalter. In: Rösler M, Retz W, von Gontard A, Paulus F W (Hrsg.) *Soziale Folgen der ADHS. Kinder - Jugendliche - Erwachsene*. Stuttgart: Kohlhammer. S. 63-75.

Diestelkamp, S. & Quaiser-Pohl, C. (2012). Identity development after the birth of the first child – an empirical study of first-time mothers in the Republic of Ireland. In Quaiser-Pohl C, Endepohls-Ulpe M (Eds.): *Women's choices in Europe - Influence of gender on education, occupational career and family development* (pp. 183-198). Münster, New York: Waxmann.

Conferences – oral presentations and poster presentations

- Diestelkamp, S.,** Wartberg, L., Arnaud, N., & Thomasius, R. (2016). Moderators of effectiveness in a brief motivational intervention for alcohol intoxicated adolescent ED patients. *13th International Network on Brief Interventions for Alcohol and Other Drugs (INEBRIA) Conference*, Lausanne, CH. 22-23 September 2016. *Meeting Abstracts. Addiction Science & Clinical Practice*, 11(Suppl 1), 13.
- Diestelkamp, S.,** Wartberg, L., Arnaud, N., & Thomasius, R. (2016). Einfluss von Berater/-innen- und Interventionsvariablen auf die Veränderungs-motivation von Kindern und Jugendlichen nach einer motivierenden Kurzintervention zur Reduktion riskanten Alkoholkonsums. *Deutscher Suchtkongress 2016*, Berlin.
- Diestelkamp, S.,** & Thomasius, R. (2016). Ergebnisse aus dem Forschungsprojekt HaLT-Hamburg. Vortrag auf dem *Expertentreffen „Prävention des riskanten Alkoholkonsums im Kindes- und Jugendalter – Bisherige Forschung und Ausblick“* im Bundesministerium für Gesundheit (BMG), Berlin, am 14.03.2016.
- Diestelkamp, S.,** Arnaud, N., Wartberg, L., Daubmann, A., & Thomasius, R. (2015). Brief motivational intervention for adolescents treated in emergency departments for acute alcohol intoxication - a randomized-controlled trial. *12th International Network on Brief Interventions for Alcohol and Other Drugs (INEBRIA) Conference*, Atlanta, GA, USA. 24-25 September 2015. Meeting Abstracts. *Addiction Science & Clinical Practice*, 10(Suppl 2):O14.
- Diestelkamp, S.,** Wartberg, L., Kriston, L., Arnaud, N., & Thomasius, R. (2015). Verläufe des Alkoholkonsums bei Jugendlichen nach akuter Alkoholintoxikation. *Deutscher Suchtkongress 2015*, Hamburg. *Suchttherapie*, 16 - S_16_03.
- Diestelkamp S,** Arnaud N, Wartberg L, Lammers K, Thomasius R (2015). Vorstellung des HaLT-Hamburg Manuals zur Durchführung einer motivierende Kurzintervention am Krankenbett. Vortrag, *Fachtag „Alkoholmissbrauch im Jugendalters“ des Deutschen Zentrums für Suchtfragen des Kindes- und Jugendalters*, 2015, Hamburg.
- Arnaud, N., **Diestelkamp, S.,** Wartberg, L., Daubmann, A. & Thomasius, R. (2015). Effektivität einer motivierenden Kurzintervention bei Jugendlichen mit akuter Alkoholintoxikation: Ergebnisse einer randomisiert-kontrollierten Studie. *Deutscher Suchtkongress Hamburg*, 16.-18. September 2015.

- Arnaud, N., **Diestelkamp, S.**, Wartberg, L., Daubmann, A. & Thomasius, R. (2015). Effektivität einer motivierenden Kurzintervention für alkoholintoxikierte Jugendliche im Notfallsetting: Ergebnisse einer randomisiert-kontrollierten Studie. *22. Tagung der Fachgruppe Entwicklungspsychologie der Deutschen Gesellschaft für Psychologie (DGPs)* 31.08. bis 02.09.2015 in Frankfurt am Main.
- Thomasius, R., Arnaud, N., **Diestelkamp, S.**, Wartberg, L. & Daubmann, A. (2015). Gesundheitsnetz: Alkohol im Jugendalter. *Psychenet-Abschlusssymposium 29.-30.06.2015*, Hamburg.
- Wartberg, L., Arnaud, N., **Diestelkamp, S.** & Thomasius, R. (2015). HaLT-Hamburg: Stichprobenbeschreibung und Ergebnisse einer latenten Klassenanalyse. Vortrag, *Fachtag „Alkoholmissbrauch im Jugendalters“ des Deutschen Zentrums für Suchtfragen des Kindes- und Jugendalters*, 2015, Hamburg.
- Arnaud, N., **Diestelkamp, S.**, Kriston, L., Wartberg, L., Härter, M. & Thomasius, R. (2015). Differenzierte Muster riskanten Alkoholkonsums bei Minderjährigen im Notfallsetting. *34. Kongress der Deutschen Gesellschaft für Kinder- und Jugendpsychiatrie, Psychosomatik und Psychiatrie, DGKJ*, 2015 München, 06.03.2015.
- Arnaud, N., **Diestelkamp, S.**, Wartberg, L. & Thomasius, R. (2015). Implementation und Transfer der HaLT-Hamburg-Intervention: Ergebnisse der Prozessevaluation. Vortrag, *Fachtag „Alkoholmissbrauch im Jugendalters“ des Deutschen Zentrums für Suchtfragen des Kindes- und Jugendalters*, 2015, Hamburg.
- Diestelkamp, S.**, Kriston, L., Arnaud, N., Wartberg, L., Härter, M., & Thomasius, R. (2014). Muster riskanten Alkoholkonsums bei Minderjährigen im Notfallsetting: Eine latente Klassenanalyse. [Abstract] *Programm und Abstracts Deutscher Suchtkongress 2014*, Berlin. *Sucht*; 60, Suppl 1: 27.
- Diestelkamp, S.**, Kriston, L., Arnaud, N., Wartberg, L., Härter, M., & Thomasius, R. (2014). Drinking patterns of alcohol intoxicated adolescents in the emergency department: A latent class analysis. Poster Präsentation, *11th International Network on Brief Interventions for Alcohol an Other Drugs (INEBRIA) Conference*, Warschau. *Alcoholism and Drug Addiction*; 27, Suppl. 1.
- Diestelkamp, S.**, Arnaud, N., & Thomasius, R. (2014). Brief Interventions for Alcohol-involved Adolescents in Emergency Care: A Systematic Review. *17th Conference of the European Association of Substance Abuse Research (EASAR)*, Lüneburg.
- Diestelkamp, S.**, Sack, P. M., Wartberg, L., & Thomasius, R. (2013). Gesundheitsnetz Alkohol im Jugendalter: Verbesserung des Behandlungszugangs für Kinder und Jugendliche mit

- riskantem Alkoholkonsum. [Abstract]. 33. *Kongress der Deutschen Gesellschaft für Kinder- und Jugendpsychiatrie, Psychosomatik und Psychiatrie*, Rostock. Online: <http://www1.dgkjp-kongress.de/guest/IDee327321590dba/AbstractView?ABSID=16393> (28.11.2013).
- Arnaud, N., **Diestelkamp, S.**, Wartberg, L. & Thomasius, R. (2013). Gesundheitsnetz Alkohol im Jugendalter: Verbesserung des Behandlungszugangs für Kinder und Jugendliche mit riskantem Alkoholkonsum. XXXIII. *Kongress der Deutschen Gesellschaft für Kinder- und Jugendpsychiatrie, Psychosomatik und Psychotherapie (DGKJP)*, Rostock 06. - 09. März 2013.
- Arnaud, N., **Diestelkamp, S.**, Wartberg, L. & Thomasius, R. (2013). Gesundheitsnetz Alkohol im Jugendalter: Verbesserung des Behandlungszugangs für Kinder und Jugendliche mit riskantem Alkoholkonsum. *Deutscher Suchtkongress 2013*, Bonn 20.09.2013.
- Diestelkamp, S.**, Sack, P. M., Wartberg, L., & Thomasius, R. (2012). Motivierende Kurzintervention für riskant Alkohol konsumierende Jugendliche im Notfallsetting – Eine randomisiert-kontrollierte Studie. Poster Präsentation, 5. *Deutscher Suchtkongress*, Berlin.
- Diestelkamp, S.**, Sack, P. M., Wartberg, L., & Thomasius, R. (2012). Gesundheitsnetz Alkohol im Jugendalter: Verbesserung des Behandlungszugangs für Kinder und Jugendliche mit riskantem Alkoholkonsum. *Kongress der Deutschen Gesellschaft für Kinder- und Jugendmedizin (DGKJ)*, Hamburg. *Monatsschrift Kinderheilkunde*; 160 (1), Suppl 1. Abstracts der 108. Jahrestagung der Deutschen Gesellschaft für Kinder- und Jugendmedizin e.V. (DGKJ).
- Thomasius, R., Sack, P.-M., **Diestelkamp, S.**, Stolle, M. & Küstner, U. J. (2011). Moderne Ansätze zur Prävention des Alkoholmissbrauchs bei Jugendlichen. [Abstract]. Abstracts der 107. Jahrestagung der Deutschen Gesellschaft für Kinder- und Jugendmedizin e.V. (DGKJ). *Monatsschrift Kinderheilkunde* 159, Suppl. 3, 170.

APPENDIX III

Curriculum Vitae

- since 10/2010 German Center for Addiction Research in Childhood and Adolescence, University Medical Center Hamburg-Eppendorf
Research Associate
- Project „Health network ‘alcohol abuse in adolescence’: Improved access-to-care for children and adolescents with at-risk alcohol use (“HaLT-Hamburg”)
- 12/2009 – 09/2010 Bildungs- und Förderstätte Himmelmoor, Pinneberg
Psychologist
Vocational training for adolescents with special psychosocial needs
- 03/2009 – 11/2009 Parental leave
- 10/2007 – 02/2009 Festina Lente Foundation, Bray, Republic of Ireland
Psychologist
Rehabilitation programme and vocational training for adolescents with special psychosocial needs
- 01/2006 – 09/2007 Parental leave
- 10/1999 – 12/2005 University of Trier
Psychology
- Degree: Diplom-Psychologin (grade 1,3)
Supervisor: Prof. Dr. phil. Claudia Quaiser-Pohl
- Diploma thesis entitled: „*Identity development after the birth of the first child – an empirical study of first-time mothers in the Republic of Ireland*“. (grade: 1,0)
- 10/2002 – 12/2002 Grupo Medico Carracci, Mexico City, Mexiko
Institute for Psychotherapy und Research
Research Internship

RAISED THIRD-PARTY FUNDING

- 10/2016 Project *Localize it! – Local Strategies to Reduce Underage and Heavy Episodic Drinking* (Workpackage 3 “Evaluation”)
- 3rd EU Health Programme (30 months, 101.000,-€)
(Coordinating investigator: Landschaftsverband Westphalen-Lippe, Koordinationsstelle Sucht)

INTERNATIONAL RESEARCH COOPERATIONS

03/2014 – 01/2016 Initialising of a joint proposal in the EU funding programme Horizon2020 in cooperation with 12 partners from 8 European countries

(King's College London, UK; Karolinska Institut Stockholm, SE; Hospital Clinic de Barcelona, ES; Laboratoři pro léčbu závislosti Psychiatrického centra Praha, CZ; Generalitat de Catalunya, ES; Warsaw Institute of Psychiatry and Neurology, PL; Trimbos Institute Amsterdam, NL; University of Kent, UK; University of Newcastle upon Tyne, UK).

TEACHING

since 03/2014 Lecturer in the "2nd Track Preventive Medicine", module Addiction Prevention, for medical students at the University Medical Center Hamburg-Eppendorf

Seminar „*Introduction to Addiction Prevention*“ (2., 3., 4. Fachsemester)

Seminar „*Motivational Counselling*“ (8. Fachsemester)

Seminar „*Scientific writing*“ (5. Fachsemester)

since 11/2015 Lecturer at the Training Academy of the German Society for Behavioural Therapy (Ausbildungsakademie der Deutschen Gesellschaft für Verhaltenstherapie) (DGVT) e.V., Hamburg, Germany

Seminar "*Motivational counselling*" (*Motivierende Gesprächstechniken*)

REVIEWER IN PEER-REVIEWED JOURNALS

since 06/2015 Reviewer for *Addictive Behaviors* (IF 2.44)